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Thermodynamic and Related Properties of Parahydrogen From the Triple Point to 100 °K At Pressures to 340 Atmospheres

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Experimental programs on parahydrogen at this laboratory have provided pressure-density-temperature relations and heat capacities at temperatures from 15 to 100 °K and at pressures from 2 to 350 atm. The two types of data have been correlated to yield a consistent set of functions. The properties tabulated for selected isobars and isochores are temperature, volume or pressure, the isotherm derivative $(\partial P/\partial \rho)_T$, the isochore derivative $(\partial P/\partial T)_\rho$, internal energy, enthalpy, entropy, the specific heats at constant volume and at constant pressure, and the velocity of sound. Also presented are the derived Joule-Thomson inversion curve and some comparisons with normal hydrogen near 100 °K.

Key words: density, enthalpy, entropy, equation of state, fixed points (PVT), hydrogen, Joule-Thompson data, latent heat, melting curve, parahydrogen, properties of fluids, specific heat, vapor pressure, velocity of sound.

1. Introduction

The current large-scale use of liquid parahydrogen [1][1] has led to the experimental determination of volumetric properties and specific heats at this laboratory. The results are used here for the computation of tables of thermodynamic and related functions. Provisional tables of some of these properties have been issued previously [2], computed by means of a modified Benedict-Webb-Rubin equation of state; however, this equation did not describe the volumetric properties within experimental accuracy. In the present report, therefore, polynomials representing isotherms and isochores are combined with numerical methods of computation for the purpose of improving accuracy, in particular for the derivatives of the P-ρ-T surface.

About 1200 closely spaced P-ρ-T points have been measured for parahydrogen between 15 and 100 °K and between 2 and 350 atm [3, 4]. The P-ρ-T surface was approximated by a large number of polynomials at high densities, while virial expansions were used at low densities, to allow extrapolation to pressures below 2 atm. The virial coefficients were extrapolated below 24 °K to permit computations for the vapor down to the triple point. The results for the compressed liquid at temperatures below 17 °K are based on limited experimental data.

The representation of the P-ρ-T surface, and the specific heats of the ideal gas derived from spectroscopic data [5, 6] yield thermal properties for the vapor at temperatures below critical, and for all states at temperatures above critical. Experimental specific heats [7] not only served as a check on results above critical temperatures, but were also used as primary data for the compressed liquid states at subcritical temperatures. Consistency in this latter region was examined by means of derived heats of vaporization [8] and the specific heats of the saturated liquid [9]. Other relations such as the isothermal and adiabatic compressibilities can be computed from the various tabulated properties.

Results near 100 °K were also compared with those for normal hydrogen from other laboratories [5, 10, 11, 12].

2. Symbols and Units

The symbols and units used in this paper are listed below. Values for fixed points, parameters, and conversion factors are given where applicable.

R gas constant; 82.0597 cm³ atm/g mole °K

P pressure, atm
- P_{sat} vapor pressure
- P_{melt} melting pressure
- P_c critical pressure, 12.759 atm
- P_t triple point pressure, 0.0695 atm

V specific volume, cm³/g mole

T absolute temperature, degrees Kelvin, where the triple point of water is 273.16 °K; experimental values are based on the NBS-1955 scale for platinum resistance thermometers;
- T_c critical temperature, 32.976 °K
- T_t triple point temperature, 13.803 °K

ρ density, g/mole cm³
- ρ_c critical density, 0.01559 g mole/cm³
- ρ_t density of liquid at triple point, 0.038207 g mole/cm³
- $\rho_{sat\ L}$ saturated liquid density
- $\rho_{sat\ G}$ saturated vapor density
- $\rho_{melt\ L}$ density of liquid along the liquid-solid boundary
- ρ_1 a selected density in the compressed liquid 0.037821 g mole/cm³

$(\partial P/\partial \rho)_T$ isotherm derivative, atm cm³/g mole

[1] Figures in brackets indicate the literature references on p. 12.

$(\partial P/\partial T)_\rho$ isochore derivative, atm/°K

A_i generalized coefficients in approximating polynomials; numerical values are distinct for each equation

B the second virial coefficient, cm^3/g mole

C the third virial coefficient, $[cm^3/g\ mole]^2$

$C_v(T, \rho)$ heat capacity at constant volume at T and ρ, J/g mole °K; C_v^o, heat capacity at constant volume of the ideal gas

$C_p(T, \rho)$ heat capacity at constant pressure at T and ρ, J/g mole °K

$S(T, \rho)$ entropy at T and ρ, J/g mole °K; $S°$, entropy of the ideal gas at 1 atm

$H(T, \rho)$ enthalpy at T and ρ, J/g mole; $H°$ enthalpy of the ideal gas at 1 atm

$U(T, \rho)$ internal energy at T and ρ, J/g mole

C_{sat} heat capacity of the saturated liquid, J/g mole °K

W velocity of sound, meter/sec; W_o velocity of sound in the ideal gas

Molecular weight, 2.01572 g/g mole*

1 calorie equals 4.184 joules

3. Representation of the P-ρ-T Data

An accurate wide-range equation of state for parahydrogen is not yet available. A modified Benedict-Webb-Rubin equation has previously been used [2] to obtain thermodynamic functions over wide temperature and pressure ranges. This equation of state has also been used in this laboratory in obtaining thermodynamic functions for several other fluids. A comparison of these previous calculations for parahydrogen with the present calculations and the experimental specific heats [7] leads to the following generalizations:

a. The modified Benedict-Webb-Rubin equation [2] approximates the P-ρ-T surface reasonably well, but not within the experimental accuracy. The deviations between experimental data and calculated values are as high as 2 percent in pressure or density.

b. The derived properties which depend on the first derivatives of the surface, such as entropy, can be established well enough for most engineering purposes by the equation of state in [2]. The maximum deviations in entropy when compared to the present calculations are on the order of 3 percent.

c. The representation by the equation of state from [2] of those derived properties which depend on the second derivatives of the surface, such as the specific heats, is not at all successful. Errors as large as 20 percent are encountered near the critical point, and also at temperatures near 33 °K with pressures from critical to nearly 300 atm.

d. The application of the equation of state from [2] may be justified and successful with accuracies approaching the experimental precision, if the surface to be described is restricted to temperatures somewhat above critical. The P-ρ-T surface defined by this equation gives neither a good representation near critical temperatures, nor will it reproduce the saturation boundaries well.

Attempts to fit an equation of state of the Hirschfelder-McGee-Sutton type to several other gases [13] at this laboratory were not as successful as using the modified Benedict-Webb-Rubin equation.

The purpose of the present calculations is to obtain the best possible values for the derived functions. The P-ρ-T surface is therefore approximated by a large number of polynomials along lines of constant temperature, along lines of constant density, and along the two-phase boundaries. It should be emphasized that the polynomials are used merely as empirical interpolating devices. If several algebraic expressions approximate a set of data within experimental error, the expression selected gives the best results in terms of the derived properties. It might have been possible to place restraints on the derivatives to obtain a smooth transition at points of change in the representation. Instead, the discontinuities that do occur in the derivatives and thus in the derived properties, described in detail later in the paper, are taken as one measure of the errors in the derived properties.

The application of a polynomial approximation of such high degree is perhaps unconventional. As an alternate procedure the "spline-fit" [14] was considered. The basic technique (a cubic polynomial between two adjacent points) was tested on the specific heat data of the ideal gas and on the experimental points of the 33 °K isotherm. In both cases interpolations were obtained with deviations to one part in 1000. The "spline-fit" technique resulted in good interpolations between adjacent points, provided that the initial entries were smooth. However, "spline-fit" did not appear to be a satisfactory way of smoothing experimental data, which is subject to random errors. This technique may place an unacceptable inflection point between two experimental points. Also, the "spline-fit" imposes linear changes in curvature between two adjacent points while rapid changes in curvature are encountered in the precise definition of the specific heats. The "spline-fit" method was also combined with a least squares technique. The cubic polynomials

*2.01594 on the C^{12}=12.000 scale to be adopted.

were least squared over several ranges of approximately seven data points each with appropriate restrictions on the derivatives of the adjacent ranges. In the case of the 33 °K, isotherm this amounts to at least six ranges, none of which have constant curvature. The number of arbitrary constants used in this procedure is very nearly equal to the 15 used in the polynomial approximation, and while the first objection above may have been overcome, the second still applies.

Isotherms. The experimental P-ρ-T data provided 39 isotherms, which, as described in [4], have been represented by

$$P=RT\rho+\Sigma_i A_i\rho^{(i+1)}, \text{ where } i=1, 2, 3 \ldots 15. \quad (1)$$

The maximum value of i is 15 for the 33 °K isotherm. The value is smaller for all other isotherms, ranging down to 4 for the 17 °K isotherm and 5 for the 100 °K isotherm. Additional isotherms at 13.8, 14, 15, and 16 °K were established from a more limited number of experimental points and from the properties on the saturation boundaries. The functional form of these isotherms is also that of eq (1). Coefficients for all isotherms are given in table I, while representative deviations for selected isotherms are shown in table II. The deviations are within the experimental precision as described in [4]. The coefficients were obtained from the data given in table 1 of [4], applying the slight shift in densities as described in [4]. The coefficients will reproduce table 2 of [4], but care must be taken to avoid round-off errors. This is particularly true of the 33 °K isotherm. The form of eq (1) is such that A_1 will reproduce RTB within 0.3 percent, while A_2 approximates RTC, where B and C are the second and third virial coefficients, respectively. The other coefficients in the power series have no significance.

Isochores. The isotherm polynomials permitted calculation of pressures at even increments of density as given in table 2 of [4]. The pressure-temperature pairs so obtained for a given density, including the intersections at the appropriate lines of saturation, were fitted by a least squares procedure to

$$P=A_1T^2+A_2T+A_3+A_4/T+A_5/T^2. \quad (2)$$

A total of 90 sets of coefficients for (2) describes the lines of constant density between 0.0005 and 0.0450 g mole/cm³. Numerical values for the coefficients of (2) are given in table III, while representative deviations in pressure are shown in table IV.

Low density. At densities of 0.0070 g mole/cm³ and less, the isochore polynomials (2) were replaced by the truncated virial expansion

$$P=RT\rho+RTB\rho^2+RTC\rho^3. \quad (3)$$

Values of RTB and RTC were obtained from the low-density data on all isotherms from 24 to 100 °K as described in [3]. The virial coefficients were approximated by

$$RTB=A_1T+A_2+A_3/T+A_4/T^2 \quad (4a)$$

and

$$RTC=A_1T^2+A_2T+A_3+A_4/T+A_5/T^2+A_6/T^3. \quad (4b)$$

One set of coefficients for (4b) was used between 13.8 °K and T_c, a second set between T_c and 55 °K, while between 55 °K and 100 °K the relation used was

$$RTC=RTA_1e^{A_2/T}[1-e^{A_3\{1-(T/A_4)^{A_5}\}}]. \quad (4c)$$

A number of functions can be found which will fit the RTC data within experimental accuracy; however, relations (4b) and (4c) were selected on the basis of the behavior of their first and second derivatives. Values for the coefficients for eqs (4a), (4b), and (4c), are found in table V.

Two-phase boundaries. The densities of the saturated liquid and vapor, respectively, have been represented by

$$\rho_{\text{sat L}}=\rho_c+A_1(T_c-T)^{0.380}+A_2(T_c-T)+A_3(T_c-T)^{4/3}+A_4(T_c-T)^{5/3}+A_5(T_c-T)^2, \quad (5a)$$

and

$$\rho_{\text{sat G}}=\rho_c+A_1(T_c-T)^{0.370}+A_2(T_c-T)+A_3(T_c-T)^{0.7}+A_4(T_c-T)^{0.8}, \quad (5b)$$

as given in [8]. However, the saturated vapor densities below the normal boiling point are calculated from (3), (4a), (4b), and the vapor pressure equation rather than by (5b).

The melting pressures are given by Goodwin [15] as

$$P_{\text{melt}}=P_t+(T-T_t)[A_1e^{-\alpha/T}+A_2T], \quad (6)$$

while the saturated liquid densities along the liquid-solid boundary from [16] are approximated by

$$\rho_{\text{melt L}}=\rho_t+\rho_tA_1[1-e^{-\delta(T-T_t)/T_t}]. \quad (7)$$

TABLE V. *Coefficients for equations 4a, 4b, 4c*

	A-1	A-2	A-3	A-4	A-5	A-6
Equation 4a	1.9397741×10³	−1.9279522×10⁵	−2.2890051×10⁶	1.1094088×10⁷	5.1405848×10¹¹	−3.3123453×10¹²
Equation 4b $T<T_c$	1.0541776×10⁶	−1.6597141×10⁷	1.0431411×10⁹	−3.2538718×10¹⁰	1.0789413×10¹¹	−1.1515642×10¹²
Equation 4b $T_c<T<55$ °K	1.6971294×10³	−5.0854223×10⁵	6.7284118×10⁷	−3.8045171×10⁹		
Equation 4c	388.682	45.5	0.60	20.0	4.0	

Additional data. The vapor pressure equation from [17], the heats of vaporization and critical parameters as given by [8], and the properties of the ideal gas at 1 atm [5, 6] have been used either directly or as supplemental information for comparisons and tests.

4. Calculation of Thermodynamic Properties

A computer program has been developed which will determine a value of density corresponding to arguments of temperature and pressure. An interpolation scheme utilizes the isotherm equations, the isochore equations, and the functions representing the saturation boundaries. Both the isotherm derivative $(\partial P/\partial \rho)_T$ and the isochore derivative $(\partial P/\partial T)_\rho$ are obtained and used in this interpolation scheme. In the region near the critical point, direct differences in the table of pressures [4] are used rather than the isochore polynomials. After the point on the P-ρ-T surface is thus defined, the program calculates the remaining properties.

Thermodynamic properties, regions. Thermodynamic functions have been calculated for regions I and II as defined in figure 1. Region I covers the gas at densities typical of the vapor at temperatures above saturation. It also includes gas at higher densities above 46 °K and up to a pressure of 350 atm. Region II covers the fluid at liquid densities, up to 46 °K, and to the same limit in pressure. For values in region I, the computations proceed from the properties of the ideal gas at 1 atm [5, 6] as the line of reference. In region II, or on the liquid-solid boundary, an auxiliary table of smoothed experimentally determined values of C_v, for a particular constant density (ρ_1=0.037821 g mole/cm³), is utilized as the line of reference; these values are presented in table VI. The properties on the vapor pressure curve are determined with the appropriate densities for the saturated liquid or saturated vapor.

Equations. The integrations indicated in the equations below are accomplished in closed form in the low-density region, that is, for densities up to 0.0070 g mole/cm³. For higher densities the appropriate derivatives of the isochores are calculated at all intermediate tabulated densities [4], and the integration is performed numerically by employing the trapezoidal rule. In the region near the critical point (at temperatures from 32 to 37 °K, and at densities from 0.007 to 0.0210 g mole/cm³) the isochore derivatives are found by direct differences from the table of pressures reported in [4] rather than from the isochore equations.

The following isothermal equations are used in region I:

$$C_v(T,\rho)=C_v^\circ-T\int_0^\rho \frac{1}{\rho^2}\left(\frac{\partial^2 P}{\partial T^2}\right)_\rho d\rho, \tag{8}$$

$$S(T,\rho)=S^\circ-R\ln\left(\frac{RT\rho}{P_0}\right)+\int_0^\rho\left[\frac{R}{\rho}-\frac{1}{\rho^2}\left(\frac{\partial P}{\partial T}\right)_\rho\right]d\rho, \tag{9}$$

where P_0=1 atm;

$$H(T,\rho)=H^\circ+\frac{P}{\rho}-RT+\int_0^\rho\left[\frac{P}{\rho^2}-\frac{T}{\rho^2}\left(\frac{\partial P}{\partial T}\right)_\rho\right]d\rho. \tag{10}$$

The values of C_v°, S°, and H° are obtained from [5, 6].

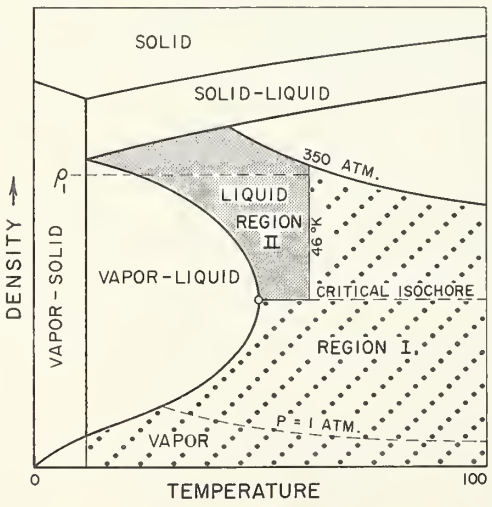

FIGURE 1. *Regions for thermodynamic computations.*

TABLE VI. *Heat capacity at constant density*

(ρ_1=0.037821 g mole/cm³)

Temperature	C_v	Temperature	C_v
°K	J/g mole °K	°K	J/g mole °K
13.5	9.355	30.5	12.970
14.0	9.544	31.0	13.029
14.5	9.728	31.5	13.088
15.0	9.904	32.0	13.142
		32.5	13.196
15.5	10.075	33.0	13.247
16.0	10.238	33.5	13.297
16.5	10.397	34.0	13.347
17.0	10.548	34.5	13.397
17.5	10.694	35.0	13.443
18.0	10.832		
18.5	10.966	35.5	13,489
19.0	11.092	36.0	13.535
19.5	11.213	36.5	13.581
20.0	11.326	37.0	13.623
		37.5	13.665
20.5	11.435	38.0	13.703
21.0	11.539	38.5	13.736
21.5	11.640	39.0	13.770
22.0	11.736	39.5	13.799
22.5	11.832	40.0	13.832
23.0	11.916		
23.5	12.000	40.5	13.862
24.0	12.083	41.0	13.895
24.5	12.163	41.5	13.924
25.0	12.238	42.0	13.958
		42.5	13.991
25.5	12.314	43.0	14.025
26.0	12.385	43.5	14.058
26.5	12.456	44.0	14.092
27.0	12.527	44.5	14.125
27.5	12.598	45.0	14.159
28.0	12.665		
28.5	12.732	45.5	14.192
29.0	12.795	46.0	14.226
29.5	12.853		
30.0	12.912		

For region II the values of the thermodynamic properties at $T=46$ °K and ρ_1 serve as the starting point. Property differences are first calculated along the path of constant density to the desired temperature, and then along an isothermal path to the desired density. Considering first the increments along the line of constant density, no increment is calculated for $C_v(T, \rho_1)$, which is interpolated directly from table VI. The entropy is

$$S(T, \rho_1)=S(46°, \rho_1)+\int_{46°}^{T}[C_v(T, \rho_1)/T]dT, \quad (11)$$

while the enthalpy is computed through the internal energy as $H=U+P\cdot V$.

Thus,

$$H(T, \rho_1)=U(46°, \rho_1)+\int_{46°}^{T}C_v(T, \rho_1)dT+P(T, \rho_1)/\rho_1. \quad (12)$$

Finally, the isothermal contributions are calculated as follows:

$$C_v(T, \rho)=C_v(T, \rho_1)-T\int_{\rho_1}^{\rho}[(\partial^2 P/\partial T^2)_\rho/\rho^2]d\rho, \quad (13)$$

$$S(T, \rho)=S(T, \rho_1)-\int_{\rho_1}^{\rho}[(\partial P/\partial T)_\rho/\rho^2]d\rho, \quad (14)$$

and

$$H(T, \rho)=H(T, \rho_1)+\int_{\rho_1}^{\rho}[[P-T(\partial P/\partial T)\rho]/\rho^2]d\rho +P/\rho-P(T, \rho_1)/\rho_1. \quad (15)$$

In both regions the internal energy and the specific heat at constant pressure are computed from

$$U(T, \rho)=H(T, \rho)-P/\rho, \quad (16)$$

and

$$C_p(T, \rho)=C_v(T, \rho)+T(\partial P/\partial T)_\rho^2/\rho^2(\partial P/\partial \rho)_T. \quad (17)$$

The derivative $(\partial P/\partial \rho)_T$ was found when interpolating for density, while $(\partial P/\partial T)_\rho$, at the desired temperature T, is the isochore slope linearly interpolated from the two tabulated isochores bracketing the density ρ.

5. Related Functions

Two related functions are treated in this report, the velocity of sound, and the Joule-Thomson inversion curve. Other related properties such as adiabatic and isothermal compressibilities may be derived from the tabulations where values of isotherm and isochore derivatives have been included to facilitate such computations.

The velocity of sound. The velocity of sound, W, was calculated by means of (17) and the relation

$$W^2=K\,C_p(\partial P/\partial \rho)_T/C_v. \quad (18)$$

The constant of proportionality, K, is 50.26 where W is in meter/sec, C_p and C_v are in J/g mole °K, P is in atm, and ρ is in g mole/cm³. Figure 2 illustrates the variation of velocity with temperature along a few selected isobars, while tables VII and XV give a comparison with other sources. The detailed discussion of this comparison will be found in the appendix. The agreement between the calculated velocities and the other sources considering the errors discussed in section 9, is favorable, and is taken as a further indication of the internal consistency between the P-ρ-T surface, the various derivatives, and the specific heats.

TABLE VII. *Comparison of calculated and experimental velocities of sound in normal hydrogen*

T	P	ρ	$\frac{W}{W_o}$ [Normal] (other sources)	$\frac{W}{W_o}$ [Normal] (calc., this research)	$\frac{W}{W_o}$ [Para] (this research)
°K	atm	amagat	Ref. [30]		
70.13	20		1.026	1.015	1.012
70.13	40		1.067	1.056	1.052
70.13	60		1.133	1.126	1.120
70.13	70		1.171	1.170	1.164
77.25	20		1.029	1.019	1.016
77.25	40		1.065	1.056	1.051
77.25	60		1.117	1.114	1.107
77.25	70		1.156	1.149	1.141
90.10	20		1.029	1.022	1.019
90.10	40		1.060	1.056	1.050
90.10	60		1.103	1.102	1.092
90.10	70		1.127	1.132	1.117
			Ref. [11]		
98.15		80	1.035	1.037	1.030
98.15		200	1.125	1.126	1.115
98.15		280	1.211	1.210	1.197
98.15		360	1.322	1.320	1.307
98.15		440	1.460	1.453	1.440
98.15		520	1.628	1.618	1.608
98.15		600	1.810	1.805	1.800
			Ref. [33]		
30.00		91	0.889	0.869	0.869
40.00		219	0.933	0.929	0.929
50.00		491	1.41	1.430	1.430
100.00		303	1.24	1.242	1.227

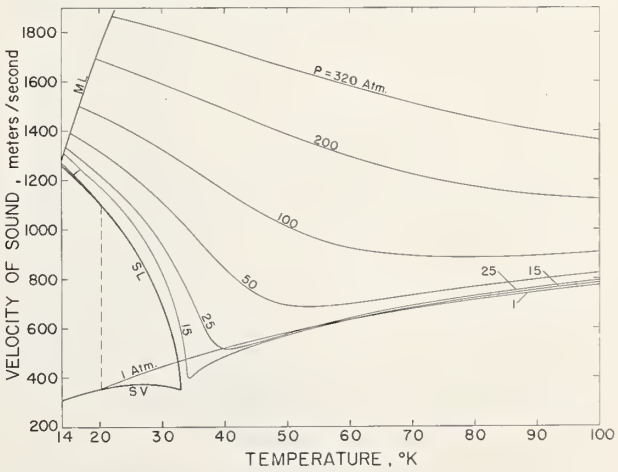

FIGURE 2. *Velocity of sound in parahydrogen as a function of temperature on selected isobars.*

SL and *SV* represent saturated liquid and saturated vapor, respectively. *ML* represents liquid at the melting line.

The Joule-Thomson inversion curve. The locus of the maxima of the isenthalpic curves with respect to temperature has been calculated from the P-ρ-T data and the definition of the Joule-Thomson coefficient, $\mu=(\partial T/\partial P)_H$. When $\mu=0$, the relation

$$T(\partial P/\partial T)_\rho=\rho(\partial P/\partial \rho)_T \qquad (19)$$

defines the P-ρ-T coordinates of the inversion curve. The results are presented in table VIII. The fourth column in table VIII, labeled uncertainty, is the uncertainty in the inversion curve due to an assumed uncertainty of 0.5 percent in either the isotherm or the isochore derivatives. The calculated curve satisfies the criterion, pointed out by Brown [18], that the inversion curve should intersect each isochore only once. The inversion curve represented in table VIII is in fair agreement with the results given by Brown [18], which are based on earlier measurements of the inversion curve of normal and para-hydrogen. Quantitative comparison is difficult, however, due to the small scale of the graphs generally presented to illustrate this property in the literature. Koeppe [19], using the data for normal hydrogen of Johnston et al. [20], calculated the intersection of the inversion curve with the vapor pressure curve to be 27.05 °K. Our value of 27.08±0.04 °K is in excellent agreement with that result.

TABLE VIII. *Joule-Thomson inversion curve for para-hydrogen*

Temperature	Pressure	Density	Uncertainty*
°K	atm	g mole/cm³	atm
28.000	9.87	0.03006	0.12
29.000	15.05	.02990	.12
30.000	20.08	.02973	.13
31.000	25.01	.02956	.15
32.000	29.85	.02940	.16
33.000	34.61	.02923	.17
34.000	39.16	.02905	.19
35.000	43.66	.02888	.20
36.000	48.06	.02870	.21
37.000	52.34	.02852	.23
38.000	56.52	.02834	.24
39.000	60.60	.02817	.26
40.000	64.59	.02799	.27
42.000	72.23	.02763	.31
44.000	79.46	.02726	.34
46.000	86.33	.02689	.37
48.000	92.79	.02652	.41
50.000	98.93	.02616	.45
55.000	112.70	.02523	.56
60.000	124.42	.02430	.67
65.000	134.24	.02337	.80
70.000	142.24	.02243	.94
75.000	148.7	.02151	1.1
80.000	153.5	.02058	1.3
85.000	156.9	.01965	1.5
90.000	159.3	.01875	1.7
95.000	161.1	.01791	1.9
100.000	161.4	.01704	2.2

*The uncertainty in the inversion pressure due to an assumed uncertainty of 0.5% in either $(\partial P/\partial \rho)_T$ or $(\partial P/\partial T)_\rho$.

6. Results

The results of the calculations are presented in tables IX, X, and XI. The comparison of the experimental versus the calculated specific heats at constant volume is shown in table XII. Units have been indicated in section 2, and are also entered in the column headings of the tables. The number of digits in any given column is not intended to represent accuracy; digits were selected for publication in consideration of the errors discussed in section 9, and to facilitate interpolation.

The results are presented graphically in the form of a temperature-entropy chart in figure 3, in the form of an enthalpy-entropy chart in figure 4, while the general behavior of the specific heat at constant pressure is illustrated in figure 5.

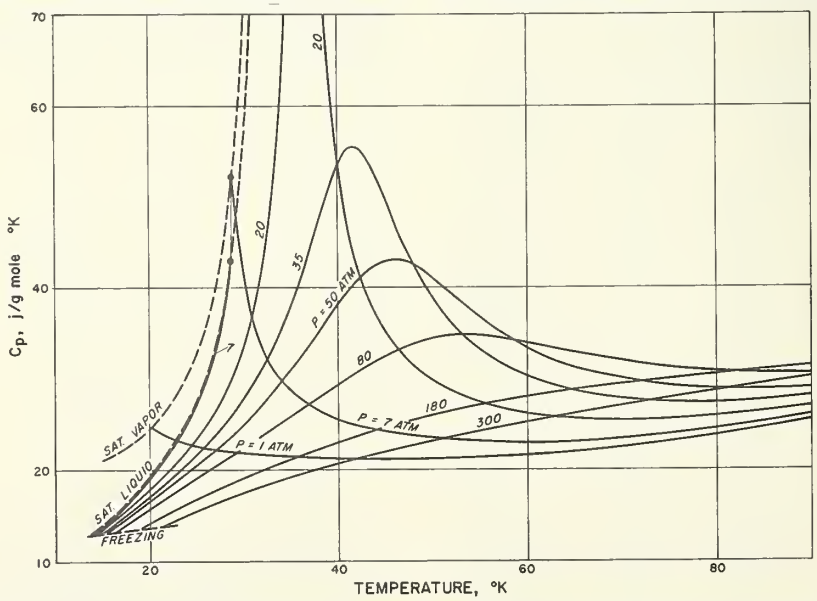

FIGURE 5. *The specific heat at constant pressure as a function of temperature on selected isobars.*

7. Normal Versus Parahydrogen Near 100 °K

The present tabulations are compared to the results of others which are, however, restricted to normal hydrogen. Only the temperature range near 100 °K is considered here, as the deviation between the P-ρ-T behavior of the two modifications is expected to increase with lowered temperatures. The values for parahydrogen are computed at the temperature and pressure reported by the other authors and are compared as follows:

1. Along the 98.15 °K isotherm to the smoothed P-ρ-T values and the derived properties of Michels et al. [10, 11];
2. Along the 100 °K isotherm to the smoothed P-ρ-T values and the derived properties of Woolley et al. [5];
3. Along the 100 °K isotherm to the smoothed P-ρ-T values of Johnston and White [12].

In the case of Michels et al. and Woolley et al., the comparisons are at approximately integral amagat densities.

8. Internal Comparisons and Tests

Values for $Z=PV/RT$ are compared directly in figure 6a, and are seen to differ by no more than 4 parts in 1000. The heat capacity from Michels can also be compared directly. The differences in heat capacities are shown in figure 6b; they vary little from the difference in the ideal gas, 4.226 J/g mole °K, calculated from spectroscopic data. For entropy and enthalpy the two modifications have different numerical values in the ideal gas state; furthermore, different authors prefer different reference states. For entropy and enthalpy, therefore, isothermal increments were calculated from the lowest density of comparison. The differences between the entropy increments are shown in figure 6c; the maximum difference between all sources is 0.084 J/g mole °K. The differences between enthalpy increments are as high as 14.6 J/g mole and are plotted in figure 6d.

The differences in the derived functions can probably be related directly to the differences in Z. The difference in the P-ρ-T behavior, however, cannot be unambiguously assigned to the different modifications of the gas, but must be attributed to differences in the experimental determinations.

Experimental versus calculated C_v. This comparison is among the more stringent tests that may be applied. Error estimates in C_v allow direct computation of errors in entropy, and indicate the quality of the calculated thermodynamic properties. The discussion that follows is a summary of the results presented in table XII.

Using eq (8), C_v was computed at the 121 experimental points published by Younglove and Diller [7] for temperatures greater than T_c. Deviations ($C_{v\ \mathrm{exp}} - C_{v\ \mathrm{calc}}$) have been plotted in figure 7 as

FIGURE 6. *Normal versus parahydrogen.**

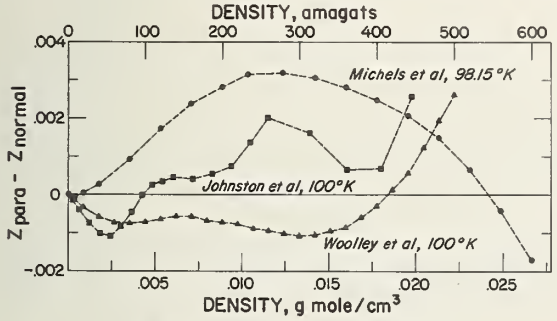

FIGURE 6a. *Differences in* Z=PV/RT.

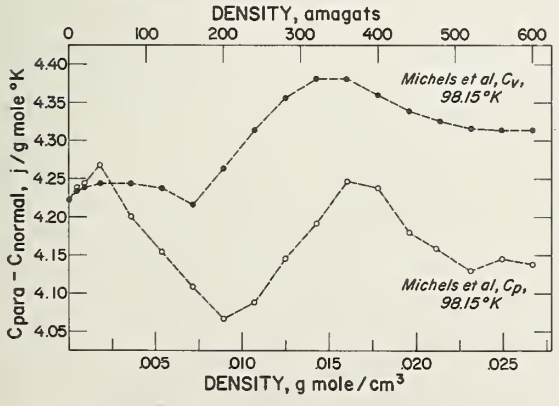

FIGURE 6b. *Differences in the heat capacities.*

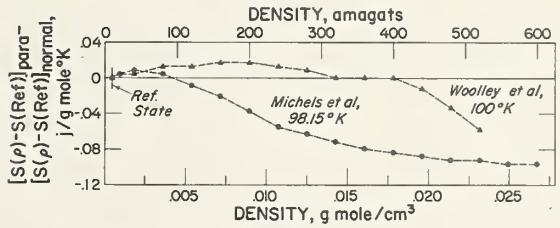

FIGURE 6c. *Differences in entropy increments.*

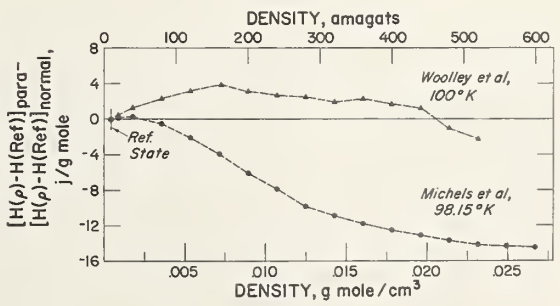

FIGURE 6d. *Differences in enthalpy increments.*

*Values for parahydrogen are derived from the present measurements. For normal hydrogen values are taken from the references as follows: ● and ○ from [10] or [11], ▲ from [5], and ■ from [12].

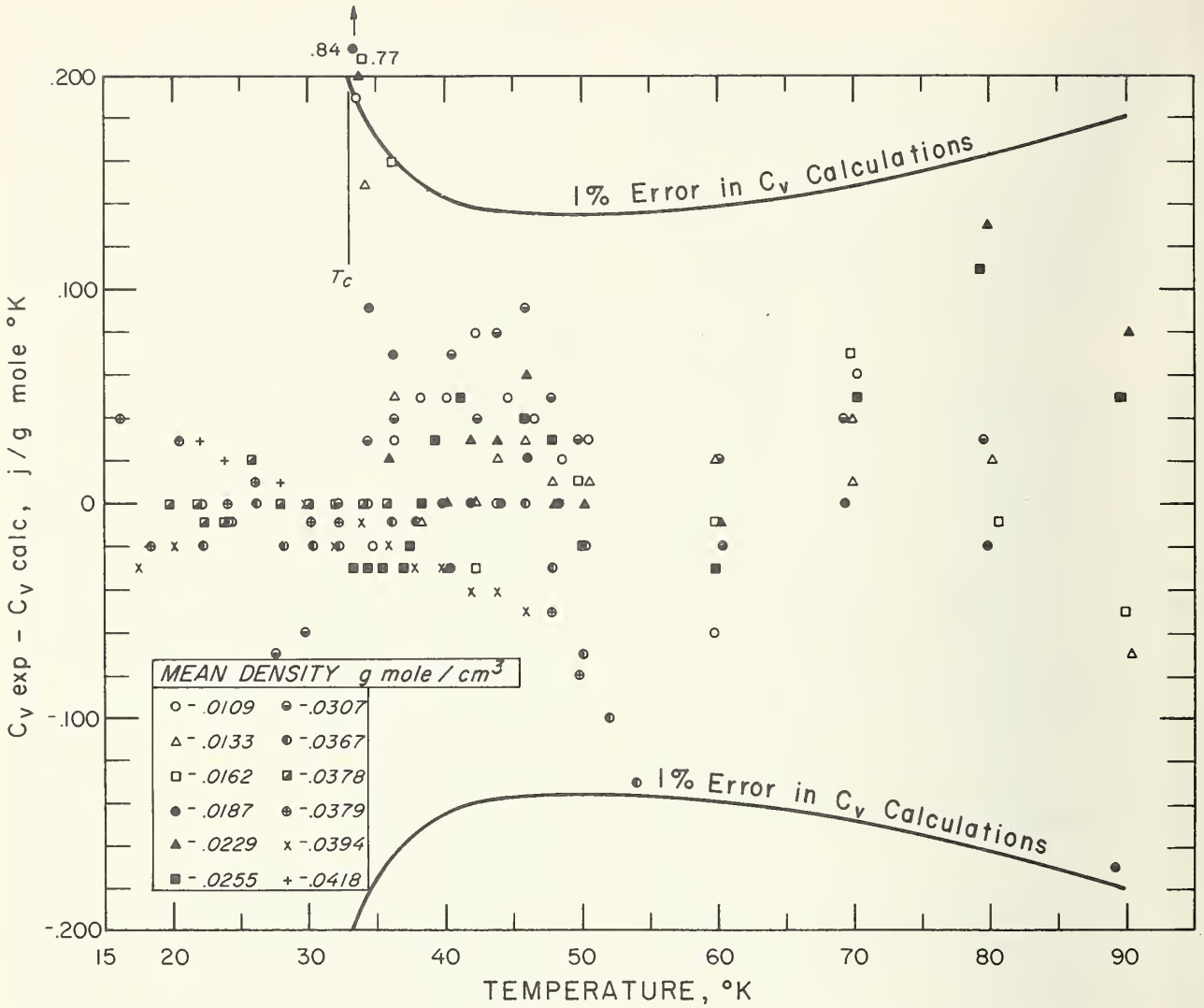

FIGURE 7. *Difference between experimental and calculated heat capacities at constant volume vs. temperature.*

a function of temperature for 12 densities. Mean deviation for all 121 experimental points is 0.071 J/g mole °K, or about twice the error estimated by the experimenters. The 20 points nearest the critical temperature contribute heavily to the overall mean deviation, ranging up to 4 percent error in C_v. Errors of this magnitude illustrate the difficulty of obtaining accurate second derivatives from the P-ρ-T data near the critical point. For the remaining 101 points above T_c, all of which lie at temperatures above 36.1 °K, the maximum errors correspond to 1 percent in C_v, with a mean deviation of 0.042 J/g mole °K which is the estimated error in the experimental values of C_v. The statistically calculated contribution (C_v^0) is approximately 90 percent of the total value of C_v and the contribution from the P-ρ-T integral about 10 percent. The P-ρ-T contribution to C_v involving second derivatives of the smoothed P-ρ-T data can be computed within 7 percent; the error in this contribution becomes as large as 15 percent near the critical point.

At temperatures below T_c in region II a smoothed table of C_v (table VI) was used as the line of reference. The values of C_v computed at experimental conditions merely show the internal consistency among the various calorimetric runs, as the P-ρ-T contribution is small. The deviations, experimental minus calculated C_v, are also plotted in figure 7. The maximum deviation in this range is twice that estimated for the experimental values; however, the mean deviation for the 42 points in this range is less than 0.017 J/g mole °K.

Heats of vaporization. The heats of vaporization have been derived from the saturated liquid and vapor densities and the derivative of the vapor pressure (dP/dT) using the Clapeyron equation and are reported in [8]. Values so calculated are listed in column 2 of table XIII. The heats of vaporization obtained in the present method are listed in column 3 of table XIII as enthalpy differences between saturated vapor and liquid, and in column 4 as entropy differences multiplied

TABLE XIII. *Heats of vaporization and entropy differences along the saturated liquid line*

Temperature	Heats of vaporization, J/g mole				Entropies, J/g mole °K		
	Clapeyron equation	ΔH_{vap}	$T \cdot \Delta S_{vap}$	Maximum difference	Saturated liquid	$(S_{T.P.} \equiv 10.016) + \int_{T.P.}^{T} \left(\frac{C_{sat}}{T}\right) dT$	Difference
°K							
13.803	907.1	905.6	905.8	1.5	10.000	10.016	−0.016
14	908.3	906.5	906.9	1.8	10.188	10.201	−.013
15	913.4	910.8	910.9	2.6	11.138	11.125	.013
16	914.2	913.2	913.2	1.0	12.079	12.054	.025
17	913.8	913.5	913.6	0.3	13.012	12.987	.025
18	911.7	911.6	911.7	.1	13.945	13.920	.025
19	907.1	907.3	907.4	−.3	14.882	14.862	.020
20	900.4	900.2	900.4	.2	15.828	15.811	.017
20.268	898.7	898.3	898.6	.4	16.079	16.067	.012
21	889.1	890.6	890.9	−1.8	16.778	16.769	.009
22	876.5	877.3	877.8	−1.3	17.740	17.736	.004
23	860.2	860.5	861.0	−0.8	18.719	18.719	.000
24	840.1	839.7	840.3	.4	19.719	19.719	.000
25	815.9	814.6	815.1	1.3	20.740	20.740	.000
26	785.8	784.3	784.8	1.5	21.794	21.794	.000
27	749.8	748.0	748.4	1.8	22.891	22.891	.000
28	705.8	704.3	704.7	1.5	24.041	24.041	.000
29	651.9	651.3	651.6	0.6	25.267	25.267	.000
30	586.2	585.6	585.8	.6	26.610	26.602	.008
31	501.2	500.6	500.8	.6	28.146	28.112	.034
32	379.9	379.6	379.7	.3	30.083	29.966	.117

by the appropriate temperatures. A comparison of columns 3 and 4 indicates that the present method is thermodynamically consistent, while a comparison of columns 2 and 3 shows that the heats of vaporization derived by the two different methods agree within 0.3 percent.

Entropy along the saturated liquid line. A comparison of the entropies of the saturated liquid calculated by the present method with the integral

$$\int_{T_t}^{T} (C_{sat}/T) dT$$

shows the internal consistency of two distinct calorimetric experiments [7, 9]. The comparison suggests a value of 10.016 J/g mole °K as entropy of the liquid at the triple point. Values and differences are given in table XIII as a function of temperature. It is seen that the agreement is excellent, with deviations ranging up to 0.025 J/g mole °K except near the critical point. The error near the critical point was anticipated by Younglove and Diller [9], who represented C_{sat} by

$$C_{sat} = \frac{A_1 T}{(T_c - T)^n} + A_2 + A_3 T + A_4 T^2 + A_5 T^3 + A_6 T^4 + A_7 T^5. \quad (20)$$

The authors used $n=0.1$ to give the best average representation of the experimental data, whereas $n=0.6$ is required to yield the proper value of the integrated function near the critical point.

Preliminary calculations. In a preliminary tabulation of thermodynamic functions the P-ρ-T surface was described by an equation of state [2]; assuming the equation to be thermodynamically correct, the present method was compared to these earlier results. No gross inconsistencies were detected as all deviations corresponded closely to the errors anticipated in the preliminary computation.

9. Discussion of Errors

The magnitude of the absolute error in entropy can be determined by completing a closed-loop calculation utilizing the Third Law. As will be seen, the detailed computation is complex. We examine only the entropy for one particular point in the phase diagram, calculated on two different paths. Ideally the resulting entropies should be the same. The point selected for the comparison is 100 percent para, saturated vapor at a pressure of 1 atm and a temperature of 20.268 °K. One path assumes zero entropy for the ideal crystal at 0 °K, and utilizes the heat capacity of the solid, the experimental value of the heat of fusion, and tabulated values of entropy for saturated liquid and vapor. The second path includes the entropy of the ideal gas at 20.268 °K calculated from statistical mechanics, and the small correction for the difference between real and ideal gas at 20.268 °K. The value obtained in following the latter path is the one given by this tabulation. It should be recalled that values tabulated are for 100 percent parahydrogen under the assumption that the P-ρ-T surface for 100 percent parahydrogen is identical with that determined experimentally for 99.79 percent parahydrogen.

The entropy contributions in J/g mole °K are as follows:

(a)	Solid, from 0 °K to 13.803 °K	1.647±.016
(b)	Fusion, (28.03 cal/g mole at 13.803 °K)	8.496±.045
(c)	Liquid, from 13.803 to 20.268 °K	6.079±.048
(d)	Vaporization, at 20.268 °K	44.334±.080
(e)	Entropy, first path	60.556
(f)	Entropy, second path, value from table IX	60.41 ±.042
	Discrepancy in entropy	0.146
	RMS combination of individual uncertainties	±.113

Contribution (a) was derived from the experimental heat capacities of the solid given by Ahlers [21] who indicated an uncertainty of 1 percent in the experimental values. A slight correction was applied to account for the orthohydrogen present in the sample (0.0021 R ln 3). Contribution (b) is based on the heat of fusion measured by several workers [5, 21, 22], while the uncertainty in this contribution is that calculated by Johnston et al. [22]. Contribution (c) is the entropy difference between the liquid at the boiling point and the triple point, as given in table IX. The corresponding uncertainty was chosen to reflect the entropy differences shown in table XIII and also the experimental uncertainty in C_{sat} given by Younglove and Diller [7]. Contribution (d) is the entropy difference between values for saturated liquid and vapor at 20.268 °K in table IX. This contribution is in agreement with the experimental heat of vaporization of Johnston et al. [22], and its uncertainty is that indicated by the experimenters. The uncertainty in the calculation of the entropy of the ideal gas [5] is given on line (f).

The actual discrepancy, 0.146 J/g mole °K, is in reasonable agreement with the statistical combination of the uncertainties in the individual contributions. The agreement is interpreted to mean that no physical anomaly has been overlooked, as only a slightly nonrandom addition of the individual uncertainties is required to account for the observed discrepancy. The discrepancy is in accord with the values for errors in entropy given in table XIV.

A rigorous calculation of other errors has not been attempted. As a guide to the user, "nominal" and "maximum" errors are specified in table XIV. These errors have been established from internal closed loop calculations, and from calculations of discontinuities along the critical isochore and critical isotherm; they are based on the internal checks of section 8, and in part on the comparison to normal hydrogen. However, the author's best judgment was also a consideration. In this context a "nominal" error is a mean or average error. The "nominal" errors include the discontinuities discussed below, and may occur anywhere in the phase diagram. A "maximum" error occurs only in areas of special difficulty such as near the critical point, or the triple point in the liquid, or along the saturated vapor boundary.

TABLE XIV. *"Nominal" and "maximum" errors in the thermodynamic properties*

Variable	Errors		Remarks
	Nominal	Maximum*	
Temperature	0.001 °K	0.02 °K	The maximum is the uncertainty in the platinum thermometer scale.
Volume	0.02 percent	0.1 percent	Maximum near critical and along the saturated vapor boundary. Originally estimated at 0.1 percent in ref. [3].
Pressure	0.001 atm	0.2 atm	Not better than 0.01 percent.
$(\partial P/\partial \rho)_T$	0.5 percent	5 percent	See discussion (sec. 9).
$(\partial P/\partial T)_\rho$	0.3 percent	1 percent	See discussion (sec. 9).
Internal energy and enthalpy.	0.6 J/g mole	2.6 J/g mole	Maximum near critical and along saturated vapor boundary.
Entropy	0.016 J/g mole °K.	0.170 J/g mole °K.	Maximum near liquid triple point, critical point, and along saturated vapor boundary.
C_v	Less than 1 percent	4 percent	Maximum near critical point and at low temperatures along saturated vapor boundary.
C_p	1 percent	∞	Not defined near critical, see discussion.
Velocity of sound	0.5 percent	4 percent	See discussion (sec. 9).

*Occurs only in areas of special difficulty such as near the critical point, or the triple point in the liquid, or along the saturated vapor boundary.

The isotherm derivatives $(\partial P/\partial \rho)_T$ and the isochore derivatives $(\partial P/\partial T)_\rho$ are accurate within 0.5 percent and 0.3 percent respectively in the interior of the region defined by the experiments. These uncertainties probably increase to 2 percent and 1 percent respectively near the upper limits of temperature and pressure. In the compressed liquid below 17 °K the isotherm derivatives may be in error by as much as 5 percent due to the scarcity of data points. The isochore first derivatives at the saturated liquid boundary have an uncertainty of about ±0.05 atm/°K except as noted below. On the vapor side of the two-phase boundary, the uncertainty is about 1 percent.

It is perhaps inevitable that discontinuities will occur whenever the numerical representation of the P-ρ-T surface is changed. While each region has been selected to give the best overall fit, the derivatives at the various boundaries were not constrained to match. Such a discontinuity occurs along the boundary of region I and II, as described in figure 1, where near the critical temperature, the enthalpy is discontinuous by 0.93 J/g mole, the entropy by 0.024 J/g mole °K, and C_v by 0.226 J/g mole °K. This discontinuity decreases to zero at 46 °K. Another discontinuity arises along the 55 °K isotherm where the representation of the third virial coefficient, RTC, changes from eq (4b) to (4c). As the density increases to 0.007 g mole/cm^3, the discontinuity in enthalpy increases to 0.58 J/g mole and remains

constant to higher densities, while the discontinuities in entropy and C_v are negligible. Figure 6b shows a minimum near 0.007 g mole/cm³. This discontinuity exists only in C_v and C_p, and is attributed to the change in second derivatives between the virial expansion and the isochore representation, a change which cannot be detected in comparison to experimental values at 90 °K. For the saturated liquid, between densities 0.0210 and 0.0215 g mole/cm³, there is a discontinuity in the isochore derivative which amounts to 0.115 atm/°K, or 4 percent. This in turn causes discontinuities of 3.7 percent and 8 percent in the velocity of sound and C_p, respectively. These discontinuities are caused by a change in the representation of the P-ρ-T surface. They decrease rapidly in the compressed liquid and amount to only half of the above values at 33 °K. The discontinuities in these quantities are a measure of their uncertainties in this region. The uncertainty in the isochore derivative at saturation drops from a maximum at density 0.0215 g mole/cm³ to about 0.1 percent at the critical point. For the same reason there is a 4.4 percent discontinuity in C_v of the saturated vapor at 32 °K.

Errors in the specific heats and the isotherm and isochore derivatives contribute to the error in the velocity of sound. Due to the form of eqs (17) and (18), however, the errors involved are partially compensating. The calculated velocities are estimated to be accurate within 0.5 percent, with the exceptions noted below. Near the high-pressure boundary (340 atm) the uncertainty increases to about 1 percent; thus the entries for 340 atm below 40 °K have a random scatter of 0.3 percent about a smooth curve, while the entries for the melting curve scatter by about 1 percent at the higher pressures. Uncertainties are larger for the saturated liquid and also in the compressed liquid below 20 °K. These problems are discussed further in the appendix. In tables X and XI the velocity values approach the ideal gas values at zero pressure due to the nature of the functions used. The uncertainty in the value of 350 meter/sec assigned to the critical point is proportional mainly to the uncertainty in C_v. This value of C_v was taken to be 19.87 J/g mole °K, and its accuracy is difficult to estimate since it involves an uncertain extrapolation of the experimental heat capacities. Several recent publications [23, 24, 25] have brought up the possibility that C_v may become infinite at the critical point. As a result the velocity of sound could have a value of zero. Our data on parahydrogen seem to be in contradiction to this possibility. Our calculations show that C_v, at critical temperature, has a maximum at somewhat less than critical density. This same behavior has been observed for isopentane by Young [26] and for carbon dioxide by Michels et al. [27].

The entire set of tables has been subjected to checks by differencing; and the derivatives $(\partial P/\partial \rho)_T$, $(\partial P/\partial T)_\rho$, and $(\partial^2 P/\partial T^2)_\rho$ were tested for the proper sign. For a small region near the critical point, at densities from 0.0150 to 0.0160 g mole/cm³ and temperatures from 32.975 to 32.984 °K, the interpolation of $(\partial P/\partial \rho)_T$ results in the wrong sign. Calculation of C_p near the critical point is subject to large errors, and values of C_p over 200 J/g mole °K should be treated as uncertain.

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10. Appendix

Calculated velocities of sound compared to results of others. In general, published experimental measurements of the velocity of sound in hydrogen below 100 °K have been restricted to the saturated liquid and to the gas at pressures below one atmosphere. Van Itterbeek, Van Dael, and Forrez [28] measured the velocity in saturated liquid para and normal hydrogen from 14 to 20.4 °K. Between 14 and 16 °K our calculations agree with their experimental values within 1 percent. From 17 to 20°K, however, our values are consistently 2 percent lower. This may perhaps be attributed to the relatively few P-ρ-T and C_v data points measured in the liquid below 20 °K. The agreement at 14 and 15 °K is probably fortuitous. The experimental work in progress at this laboratory on the velocity in the compressed liquid may resolve these differences.

A more recent publication by Van Itterbeek, Van Dael, and Cops [29] contains experimental velocities in the compressed liquid from 14.85 to 20.50 °K. Table XV gives a comparison with our

TABLE XV. *Comparison of experimental and calculated velocities of sound in parahydrogen**

Temperature	Pressure	$\frac{100(W_{exp}-W_{calc})}{W_{exp}}$
°K	ATM	
14.85	4.26	0.01
14.85	11.18	−0.05
14.85	19.74	−0.07
16.09	5.76	1.23
16.09	29.18	0.78
16.09	58.55	0.74
18.25	8.03	2.11
18.25	76.42	0.95
18.25	132.60	0.78
20.50	11.42	2.08
20.50	97.46	0.77
20.50	228.40	0.06

*Experimental values from reference [29].

values at a few points selected to cover the region of the experimental work.

Van Itterbeek et al. [30] have published experimental data for normal hydrogen at pressures up to 70 atm along three isotherms, 70.13 °K, 77.25 °K, and 90.10 °K. Their results are compared with ours at selected pressures in the first section of table VII. The values are more easily compared when reduced by the velocity in the ideal gas, W_o, which is, in general, not the same for normal and parahydrogen. In table VII, column 4 is the reduced velocity taken from smoothed curves published by Van Itterbeek et al. Column 5 is the reduced velocity in normal hydrogen calculated from our results for parahydrogen on the assumption that the two ortho-para forms have the same P-ρ-T behavior. This assumption is reasonable at least for temperatures above 50 °K. Column 6 is the reduced velocity in parahydrogen calculated from our data. Comparison of columns 4 and 5 shows that the values from [30] are consistently higher than ours. This difference increases to about 1 percent at the lower pressures. In addition their data, extrapolated to zero pressure, yields values which are about 1 percent higher than the calculated ideal gas values.

Van Itterbeek and Vermaelen [31] have published velocities for normal hydrogen gas at pressures less than one atmosphere from 50 to 100 °K. Comparison with our results is not useful here, however, since both are within 0.3 percent of the respective ideal gas values. Van Itterbeek and Keesom [32] measured the velocity in normal hydrogen at 20.42 °K from 0.15 atm to 0.92 atm. Extrapolation of their results to 1 atm leads to a value of 357.6 meter/sec, whereas we calculate 356.9 meter/sec. The ideal gas value is 374.4 meter/sec for both normal and para at this temperature.

Michels et al. [11] have calculated velocities in normal hydrogen from PVT data in the range −175 °C to 150 °C. Their results are compared with ours in the second section of table VII at −175 °C (98.15 °K). The deviations are all less than 0.6 percent.

Brown [33] has calculated the velocity in compressed normal hydrogen up to a density of 500 amagat, using the PVT data from Woolley, Scott, and Brickwedde [5]. His results are compared with ours at four points in the last section of table VII. The agreement is quite good except in the region of the critical point.

11. References

[1] Scott, R. B., Liquid hydrogen for chemical and nuclear rockets, Discovery **21,** No. 2, 74–77 (1960).

[2] Roder, H. M., and R. D. Goodwin, Provisional thermodynamic functions for para-hydrogen, NBS Tech. Note 130 (PB161631), Dec. 1961.

[3] Goodwin, R. D., Apparatus for determination of pressure-density-temperature relations and specific heats of hydrogen to 350 atmospheres at temperatures above 14 °K, J. Res. NBS **65C** (Eng. and Instr.), 231–243 (1961).

[4] Goodwin, R. D., D. E. Diller, H. M. Roder, and L. A. Weber, Pressure-density-temperature relations of fluid para-hydrogen from 15 to 100 °K at pressures to 350 atmospheres, J. Res. NBS **67A** (Phys. and Chem.), 173–192 (Mar. 1963).

[5] Woolley, H. W., R. B. Scott, and F. G. Brickwedde, Compilation of thermal properties of hydrogen in its various isotopic and ortho-para modifications, J. Res. NBS **41,** No. 5, 379–475 (Nov. 1948).

[6] Woolley, H. W., private communication.

[7] Younglove, B. A., and D. E. Diller, The specific heat at constant volume of para-hydrogen at temperatures from 15 to 90 °K and pressures to 340 atmospheres, Cryogenics **2,** No. 6, 348–352 (Dec. 1962).

[8] Roder, H. M., D. E. Diller, L. A. Weber, and R. D. Goodwin, The orthobaric densities of parahydrogen, derived heats of vaporization, and critical constants, Cryogenics **3,** No. 1, 16–22 (Mar. 1963).

[9] Younglove, B. A., and D. E. Diller, The specific heat of saturated liquid para-hydrogen from 15 to 32 °K, Cryogenics **2,** No. 5, 283–287 (Sept. 1962).

[10] Michels, A., W. deGraaff, T. Wassenaar, J. M. H. Levelt, and P. Louwerse, Compressibility isotherms of hydrogen and deuterium at temperatures between −175 °C and +150 °C (at densities up to 960 amagat), Physica **25,** 25–42 (1959).

[11] Michels, A., W. deGraaff, and G. J. Wolkers, Thermodynamic properties of hydrogen and deuterium at temperatures between −175 °C and 150 °C and at densities up to 840 amagat, Physica **25,** 1097–1124 (1959).

[12] Johnston, H. L., and David White, Pressure-volume temperature relationships of gaseous normal hydrogen from its boiling point to room temperature and from 0–200 atmospheres, Trans. ASME **72,** No. 6, 785–787 (Aug. 1950).

[13] Hust, J. G., and R. B. Stewart, Thermodynamic property values for gaseous and liquid carbon monoxide from 70 to 300 °K with pressures to 300 atmospheres, NBS Tech. Note 202, Nov. 1963.

[14] Landis, F. and E. N. Nielson, The determination of thermodynamic properties by direct differentiation techniques, Progress in International Research on Thermodynamic and Transport Properties, Second Symposium on Thermophysical Properties, pp. 218–227, Academic Press (1962).

[15] Goodwin, R. D., Melting pressure equation for the hydrogens, Cryogenics **2,** No. 6, 353–355 (Dec. 1962).

[16] Goodwin, R. D., and H. M. Roder, Pressure-density-temperature relations of freezing liquid parahydrogen to 350 atmospheres, Cryogenics **3,** No. 1, 12–15 (Mar. 1963).

[17] Weber, L. A., D. E. Diller, H. M. Roder, and R. D. Goodwin, The vapour pressure of 20 °K equilibrium hydrogen, Cryogenics **2,** No. 4, 236–238 (June 1962).

[18] Brown, E. H., On the thermodynamic properties of fluids, Bull. Intern. Inst. Refrig., Annexe 1960–1, 167–178 (1960).

[19] Koeppe, W., Bemerkung zur Inversionkurve von Wasserstoff, Kältetechnik **12,** No. 12, 376 (1960).

[20] Johnston, H. L., W. E. Keller, and A. S. Friedman, The compressibility of liquid normal hydrogen from the boiling point to the critical point at pressures up to 100 atmospheres, J. Am. Chem. Soc. **76,** 1482–6 (Mar. 1954).

[21] Ahlers, G., Lattice heat capacity of solid hydrogen, J. Chem. Phys. **41,** 86–94 (July 1964).

[22] Johnston, H. L., J. T. Clarke, E. B. Rifkin, and E. C. Kerr, Condensed gas calorimetry. I. Heat capacities, latent heats and entropies of pure parahydrogen from 12.7 to 20.3 °K. Description of the condensed gas calorimeter in use in the cryogenic

laboratory of the Ohio State University, J. Am. Chem. Soc. **72,** 3933–3938, (Sept. 1950).
[23] Bagatskii, M. I., A. V. Voronel, and V. G. Gusak, Measurement of the specific heat C_v of argon in the immediate vicinity of the critical point, Soviet Phys. J.E.T.P. **43,** 728–729 (Aug. 1962).
[24] Yang, C. N., and C. P. Yang, Critical point in liquid-gas transitions, Phys. Rev. Letters **13,** No. 9, 303 (Aug. 1964).
[25] Chase, C. E., R. C. Williamson, and L. Tisza, Ultrasonic propagation near the critical point in helium, Phys. Rev. Letters **13,** No. 15, 467 (Oct. 1964).
[26] Young, S., The thermal properties of isopentane, Proc. Phys. Soc. **13,** 602–657 (1895).
[27] Michels, A., A. Bijl, and Mrs. C. Michels, Thermodynamic properties of CO_2 up to 3000 atmospheres between 25 and 150 °C, Proc. Roy. Soc. **A160,** 376–384 (1937).
[28] Van Itterbeek, A., W. Van Dael, and G. Forrez, Measurements on the velocity of sound in fluids, Bull. Intern. Inst. of Refrig., Annex 1961–1, 167–177 (1961).
[29] Van Itterbeck, A., W. Van Dael, and A. Cops, The velocity of sound in liquid normal and parahydrogen as a function of pressure, Physica **29,** 965–973 (1963).
[30] Van Itterbeck, A., W. Van Dael, G. Forrez, and G. Droogmans, Measurements on the velocity of sound in gaseous normal hydrogen up to 75 atm., Bull. Intern. Inst. of Refrig., Annexe 1960–1, 91–97 (1960).
[31] Van Itterbeek, A., and R. Vermaelen, Mesures sur l'absorption et la vitesse de propagation du son dans l'hydrogene leger et l'hydrogene lourd entre 300 °K et 60 °K, Physica **9,** 345–355 (1942).
[32] Van Itterbeck, A., and W. H. Keesom, Measurements about the velocity of sound in hydrogen gas at liquid hydrogen temperatures, Communs. Phys. Lab. Univ. Leiden, No. 216C (1931).
[33] Brown, E. H., Expansion engines for hydrogen liquefiers, J. Res. NBS **64C** (Eng. and Instr.), 25–36 (1959).

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T = 13.803

$-2.7362469000 \times 10^{5}$ $1.1626831000 \times 10^{7}$ $-5.4569215000 \times 10^{8}$ $1.0693073000 \times 10^{10}$

T = 14.000

$-2.7253626000 \times 10^{5}$ $7.2864442000 \times 10^{6}$ $-3.1514784000 \times 10^{8}$ $7.6284550000 \times 10^{9}$

T = 15.000

$-2.6699190000 \times 10^{5}$ $1.0029355000 \times 10^{7}$ $-4.5885587000 \times 10^{8}$ $9.4900031000 \times 10^{9}$

T = 16.000

$-2.6148537000 \times 10^{5}$ $8.1543086000 \times 10^{6}$ $-3.5944479000 \times 10^{8}$ $8.1514178000 \times 10^{9}$

T = 17.000

$1.3927202795 \times 10^{6}$ $-1.2086392365 \times 10^{8}$ $3.0043639751 \times 10^{9}$ $-2.1091736290 \times 10^{10}$

T = 18.000

$8.2979422927 \times 10^{6}$ $-8.5412708605 \times 10^{8}$ $3.2183413067 \times 10^{10}$ $-5.3645475253 \times 10^{11}$ $3.4086445220 \times 10^{12}$

T = 19.000

$1.3754949312 \times 10^{6}$ $-1.3860879159 \times 10^{8}$ $4.4768285585 \times 10^{9}$ $-5.9781177810 \times 10^{10}$ $3.3417579045 \times 10^{11}$

T = 20.000

$-4.2265860500 \times 10^{7}$ $5.4885225906 \times 10^{9}$ $-2.8552308790 \times 10^{11}$ $7.4078018995 \times 10^{12}$ $-9.5744663179 \times 10^{13}$ $4.9410854979 \times 10^{14}$

T = 21.000

$3.1391805297 \times 10^{6}$ $-4.0065538099 \times 10^{8}$ $1.9626480997 \times 10^{10}$ $-4.8727924224 \times 10^{11}$ $6.2549943067 \times 10^{12}$ $-3.2326148724 \times 10^{13}$

T = 22.000

$-7.8495402170 \times 10^{6}$ $1.0294182978 \times 10^{9}$ $-5.4711094212 \times 10^{10}$ $1.4427061021 \times 10^{12}$ $-1.8769317543 \times 10^{13}$ $9.7296745261 \times 10^{13}$

T = 23.000

$6.6081943799 \times 10^{6}$ $-8.6995122325 \times 10^{8}$ $4.4898977607 \times 10^{10}$ $-1.1633247847 \times 10^{12}$ $1.5245167439 \times 10^{13}$ $-7.9908905042 \times 10^{13}$

T = 24.000

$-2.2703167414 \times 10^{5}$ $1.1029755943 \times 10^{7}$ $-4.6014059410 \times 10^{9}$ $7.6797978893 \times 10^{11}$ $-5.6832274951 \times 10^{13}$ $2.2210004348 \times 10^{15}$ $-4.7917093894 \times 10^{16}$ $5.4321544187 \times 10^{17}$ $-2.5374445754 \times 10^{18}$

T = 25.000

$-2.1845298801 \times 10^{5}$ $4.0041483547 \times 10^{6}$ $-8.2011529356 \times 10^{8}$ $2.3387866020 \times 10^{11}$ $-2.1691510581 \times 10^{13}$ $9.5739108732 \times 10^{14}$ $-2.2214987520 \times 10^{16}$ $2.6449547900 \times 10^{17}$ $-1.2813225060 \times 10^{18}$

T = 26.000

$-2.1564931312 \times 10^{5}$ $5.8371388186 \times 10^{6}$ $-1.2147135809 \times 10^{9}$ $2.3126337737 \times 10^{11}$ $-1.8341887072 \times 10^{13}$ $7.3708533789 \times 10^{14}$ $-1.5898029097 \times 10^{16}$ $1.7755403232 \times 10^{17}$ $-8.1112233168 \times 10^{17}$

T = 27.000

$-2.1051262962 \times 10^{5}$ $4.5024526855 \times 10^{6}$ $-5.4837631192 \times 10^{8}$ $1.3039311502 \times 10^{11}$ $-1.1222941596 \times 10^{13}$ $4.6496663610 \times 10^{14}$ $-1.0060419823 \times 10^{16}$ $1.1118468638 \times 10^{17}$ $-4.9896063641 \times 10^{17}$

T = 28.000

$-2.0762939800 \times 10^{5}$ $6.0281970017 \times 10^{6}$ $-1.0832171742 \times 10^{9}$ $2.0891232542 \times 10^{11}$ $-1.7089932257 \times 10^{13}$ $7.0813046116 \times 10^{14}$ $-1.5732074258 \times 10^{16}$ $1.8097591250 \times 10^{17}$ $-8.5189154881 \times 10^{17}$

T = 29.000

$-2.0399829665 \times 10^{5}$ $6.0944290049 \times 10^{6}$ $-9.9903507122 \times 10^{8}$ $1.8406649802 \times 10^{11}$ $-1.4767020559 \times 10^{13}$ $6.0389139144 \times 10^{14}$ $-1.3244607901 \times 10^{16}$ $1.5039641025 \times 10^{17}$ $-6.9892408619 \times 10^{17}$

TABLE I. COEFFICIENTS A_i FOR ISOTHERMS IN EQUATION (1)-CONTINUED *

T = 30.000

$-1.9930510098 \times 10^{5}$ $4.2467782509 \times 10^{6}$ $1.3753519803 \times 10^{8}$ $-1.0285127394 \times 10^{11}$ $2.1030356489 \times 10^{13}$
$-1.9496018335 \times 10^{15}$ $9.8476712280 \times 10^{16}$ $-2.9098704020 \times 10^{18}$ $5.0573267198 \times 10^{19}$ $-4.8103183375 \times 10^{20}$
$1.9378706506 \times 10^{21}$

T = 31.000

$-1.9649180312 \times 10^{5}$ $5.5458899410 \times 10^{6}$ $-6.1607831288 \times 10^{8}$ $1.3517651163 \times 10^{11}$ $-2.3596665785 \times 10^{13}$
$3.3893888131 \times 10^{15}$ $-3.2529478608 \times 10^{17}$ $1.9767194733 \times 10^{19}$ $-7.6800027760 \times 10^{20}$ $1.9123637559 \times 10^{22}$
$-2.9624543910 \times 10^{23}$ $2.6058297626 \times 10^{24}$ $-9.9609263365 \times 10^{24}$

T = 32.000

$-1.9350503328 \times 10^{5}$ $6.9373186417 \times 10^{6}$ $-1.6636348493 \times 10^{9}$ $5.0637612670 \times 10^{11}$ $-9.3704055906 \times 10^{13}$
$1.1178838140 \times 10^{16}$ $-8.7528036354 \times 10^{17}$ $4.5583209515 \times 10^{19}$ $-1.5877799116 \times 10^{21}$ $3.6586697848 \times 10^{22}$
$-5.3582912630 \times 10^{23}$ $4.5217607620 \times 10^{24}$ $-1.6753822146 \times 10^{25}$

T = 33.000

$-1.8723476775 \times 10^{5}$ $1.4999719858 \times 10^{6}$ $2.3160600394 \times 10^{9}$ $-1.0063395316 \times 10^{12}$ $2.5153228712 \times 10^{14}$
$-3.9905387556 \times 10^{16}$ $4.2648040664 \times 10^{18}$ $-3.1716062755 \times 10^{20}$ $1.6685452289 \times 10^{22}$ $-6.2399228830 \times 10^{23}$
$1.6469852417 \times 10^{25}$ $-2.9974796223 \times 10^{26}$ $3.5787896341 \times 10^{27}$ $-2.5226536953 \times 10^{28}$ $7.9569173817 \times 10^{28}$

T = 34.000

$-1.8488862691 \times 10^{5}$ $4.3215606863 \times 10^{6}$ $-1.3896810114 \times 10^{8}$ $4.4586371816 \times 10^{10}$ $-9.6325801836 \times 10^{12}$
$1.3984833795 \times 10^{15}$ $-1.2701931661 \times 10^{17}$ $7.2530968934 \times 10^{18}$ $-2.6570375597 \times 10^{20}$ $6.2683647514 \times 10^{21}$
$-9.2424628854 \times 10^{22}$ $7.7691902499 \times 10^{23}$ $-2.8473520151 \times 10^{24}$

T = 35.000

$-1.8177532310 \times 10^{5}$ $4.4133408513 \times 10^{6}$ $-5.5172063887 \times 10^{7}$ $-9.6827596798 \times 10^{9}$ $3.6024158141 \times 10^{12}$
$-3.8251315113 \times 10^{14}$ $2.0115412292 \times 10^{16}$ $-5.9233883954 \times 10^{17}$ $1.0080261600 \times 10^{19}$ $-9.3573929400 \times 10^{19}$
$3.6981942728 \times 10^{20}$

T = 36.000

$-1.7814838737 \times 10^{5}$ $4.1419954249 \times 10^{6}$ $2.6146841235 \times 10^{7}$ $-2.1749048736 \times 10^{10}$ $4.5849213321 \times 10^{12}$
$-4.4034967366 \times 10^{14}$ $2.2993337230 \times 10^{16}$ $-7.0033300830 \times 10^{17}$ $1.2653522663 \times 10^{19}$ $-1.2716989561 \times 10^{20}$
$5.5193689680 \times 10^{20}$

T = 37.000

$-1.7461960892 \times 10^{5}$ $3.8868326028 \times 10^{6}$ $1.0718345926 \times 10^{8}$ $-3.4551414531 \times 10^{10}$ $5.6480262001 \times 10^{12}$
$-4.9568945858 \times 10^{14}$ $2.5092683201 \times 10^{16}$ $-7.6047875801 \times 10^{17}$ $1.3842803721 \times 10^{19}$ $-1.4096659837 \times 10^{20}$
$6.2098481429 \times 10^{20}$

T = 38.000

$-1.7163854649 \times 10^{5}$ $4.1633946821 \times 10^{6}$ $-2.3910768749 \times 10^{7}$ $-5.2847387223 \times 10^{9}$ $1.9075874444 \times 10^{12}$
$-2.0942215086 \times 10^{14}$ $1.1562533830 \times 10^{16}$ $-3.6087256402 \times 10^{17}$ $6.6412609945 \times 10^{18}$ $-6.8407236618 \times 10^{19}$
$3.0739794580 \times 10^{20}$

T = 39.000

$-1.6853963905 \times 10^{5}$ $4.2284416296 \times 10^{6}$ $-6.8717583816 \times 10^{7}$ $6.5602342483 \times 10^{9}$ $1.8489675946 \times 10^{11}$
$-6.5908219083 \times 10^{13}$ $4.3958693044 \times 10^{15}$ $-1.4045183669 \times 10^{17}$ $2.5238994618 \times 10^{18}$ $-2.5364583628 \times 10^{19}$
$1.1357792965 \times 10^{20}$

T = 40.000

$-1.6470836396 \times 10^{5}$ $3.3724181266 \times 10^{6}$ $2.8005063552 \times 10^{8}$ $-6.6549522430 \times 10^{10}$ $9.0755118597 \times 10^{12}$
$-7.4291866142 \times 10^{14}$ $3.7724755667 \times 10^{16}$ $-1.1980572394 \times 10^{18}$ $2.3364368948 \times 10^{19}$ $-2.5698554428 \times 10^{20}$
$1.2219937944 \times 10^{21}$

T = 42.000

$-1.5861053957 \times 10^{5}$ $3.1690123817 \times 10^{6}$ $3.7246165872 \times 10^{8}$ $-8.8317988960 \times 10^{10}$ $1.1829375334 \times 10^{13}$
$-9.5484987495 \times 10^{14}$ $4.8235399945 \times 10^{16}$ $-1.5334536603 \times 10^{18}$ $2.9978262958 \times 10^{19}$ $-3.3008822365 \times 10^{20}$
$1.5678208548 \times 10^{21}$

TABLE 1. COEFFICIENTS A_j FOR ISOTHERMS IN EQUATION (1)-CONTINUED *

T = 44.000

$-1.5359475951 \times 10^{5}$	$4.0962442274 \times 10^{6}$	$-4.5687429380 \times 10^{7}$	$4.8988136428 \times 10^{9}$	$-1.6995649473 \times 10^{11}$
$-4.2694098185 \times 10^{12}$	$5.4293030962 \times 10^{14}$	$-1.2691095952 \times 10^{16}$	$9.3047212366 \times 10^{16}$	

T = 46.000

$-1.4815999058 \times 10^{5}$	$4.1880803906 \times 10^{6}$	$-6.3062218182 \times 10^{7}$	$6.5286749863 \times 10^{9}$	$-3.1304070275 \times 10^{11}$
$6.3268984317 \times 10^{12}$	$1.2090559054 \times 10^{14}$	$-4.6460374419 \times 10^{15}$	$3.4224387722 \times 10^{16}$	

T = 48.000

$-1.4289709695 \times 10^{5}$	$4.3430704313 \times 10^{6}$	$-1.0015478474 \times 10^{8}$	$1.0671721772 \times 10^{10}$	$-5.7717251094 \times 10^{11}$
$1.7476035113 \times 10^{13}$	$-1.6511955271 \times 10^{14}$	$-7.7547326168 \times 10^{14}$	$1.3353676047 \times 10^{16}$	

T = 50.000

$-1.3740743668 \times 10^{5}$	$4.3079274536 \times 10^{6}$	$-8.9153195730 \times 10^{7}$	$8.9471762553 \times 10^{9}$	$-4.4685100671 \times 10^{11}$
$1.3589982410 \times 10^{13}$	$-1.3818464153 \times 10^{14}$	$-2.3391448210 \times 10^{13}$	$2.3127558170 \times 10^{15}$	

T = 55.000

$-1.2486657792 \times 10^{5}$	$4.8191921227 \times 10^{6}$	$-2.3851501909 \times 10^{8}$	$3.1381120132 \times 10^{10}$	$-2.3285019081 \times 10^{12}$
$1.0887184062 \times 10^{14}$	$-2.9553113523 \times 10^{15}$	$4.4407171401 \times 10^{16}$	$-2.8618128494 \times 10^{17}$	

T = 60.000

$-1.1290347350 \times 10^{5}$	$5.2055069485 \times 10^{6}$	$-3.1922673751 \times 10^{8}$	$4.2432762272 \times 10^{10}$	$-3.2249430353 \times 10^{12}$
$1.5544493636 \times 10^{14}$	$-4.4024977985 \times 10^{15}$	$6.8523528062 \times 10^{16}$	$-4.5167937235 \times 10^{17}$	

T = 65.000

$-1.0011710195 \times 10^{5}$	$4.8350848439 \times 10^{6}$	$-1.7449417289 \times 10^{8}$	$1.9477145304 \times 10^{10}$	$-1.2034135144 \times 10^{12}$
$5.4476389091 \times 10^{13}$	$-1.5147296439 \times 10^{15}$	$2.4297497653 \times 10^{16}$	$-1.7050119592 \times 10^{17}$	

T = 70.000

$-8.7862933060 \times 10^{4}$	$4.6498736377 \times 10^{6}$	$-9.6987491543 \times 10^{7}$	$8.3550593088 \times 10^{9}$	$-2.4292007541 \times 10^{11}$
$5.6505608371 \times 10^{12}$	$-4.7058568731 \times 10^{13}$			

T = 75.000

$-7.7328248508 \times 10^{4}$	$5.2537801514 \times 10^{6}$	$-1.9358154438 \times 10^{8}$	$1.7560525895 \times 10^{10}$	$-6.7091986589 \times 10^{11}$
$1.5565779024 \times 10^{13}$	$-1.3861537547 \times 10^{14}$			

T = 80.000

$-6.5411880737 \times 10^{4}$	$5.0459744611 \times 10^{6}$	$-1.2449876773 \times 10^{8}$	$1.0873657127 \times 10^{10}$	$-3.2722428716 \times 10^{11}$
$7.0774575355 \times 10^{12}$	$-5.9030985978 \times 10^{13}$			

T = 85.000

$-5.2881744772 \times 10^{4}$	$4.2893700745 \times 10^{6}$	$8.0046229182 \times 10^{7}$	$-1.0882062428 \times 10^{10}$	$8.5433948768 \times 10^{11}$
$-2.4150823228 \times 10^{13}$	$2.6006115503 \times 10^{14}$			

T = 90.000

$-4.1167482811 \times 10^{4}$	$4.1287617988 \times 10^{6}$	$1.4742581518 \times 10^{8}$	$-1.8749216672 \times 10^{10}$	$1.3377914908 \times 10^{12}$
$-3.8327173765 \times 10^{13}$	$4.1780717716 \times 10^{14}$			

T = 95.000

$-3.1164714559 \times 10^{4}$	$4.9636724736 \times 10^{6}$	$-4.3883143487 \times 10^{7}$	$4.4122507201 \times 10^{9}$	$-1.8905239252 \times 10^{10}$

T = 100.000

$-2.0676232668 \times 10^{4}$	$5.0876801868 \times 10^{6}$	$-4.0904786694 \times 10^{7}$	$4.4707993548 \times 10^{9}$	$-2.1730880274 \times 10^{10}$

* ORDER OF COEFFICIENTS,

A1	A2	A3	A4	A5
A6	A7	A8	A9	A10
A11	A12	A13	A14	A15

TABLE II. REPRESENTATIVE DEVIATIONS FOR SELECTED ISOTHERMS

T = 18 DEG K

DENSITY G MOL/CM^3	DELTA P ATMX10^3	PCT **
* 0.03631	-1.5	0.31
0.03692	14.9	0.13
0.03788	-24.6	0.08
0.03866	-0.9	0.00
0.03936	71.1	0.10
0.04000	-106.5	0.12
0.04059	66.0	0.06
0.04113	-15.5	0.01

T = 20 DEG K

DENSITY G MOL/CM^3	DELTA P ATMX10^3	PCT **
* 0.03526	-0.9	0.10
0.03559	4.0	0.07
0.03623	-0.1	0.00
0.03690	1.3	0.00
0.03785	-8.6	0.02
0.03864	-4.7	0.01
0.03934	34.4	0.04
0.03998	-21.5	0.02
0.04057	-15.3	0.01
0.04111	7.7	0.01
0.04162	13.6	0.01
0.04210	-8.4	0.00
0.04258	0.5	0.00

T = 25 DEG K

DENSITY G MOL/CM^3	DELTA P ATMX10^3	PCT **
0.00108	0.	0.00
0.00149	0.	0.00
* 0.00199	0.	0.00
* 0.03199	-9.1	0.28
0.03215	16.3	0.36
0.03322	48.4	0.32
0.03385	-29.5	0.13
0.03438	-15.7	0.05
0.03494	36.7	0.10
0.03553	-46.8	0.10
0.03618	9.9	0.02
0.03684	-3.3	0.00
0.03780	-12.9	0.01
0.03858	10.9	0.01
0.03928	29.4	0.02
0.03992	17.4	0.01
0.04051	-1.8	0.00
0.04105	1.1	0.00
0.04157	-10.5	0.00
0.04205	-52.6	0.02
0.04253	-27.0	0.01
0.04296	-2.5	0.00
0.04340	47.1	0.02
0.04377	94.8	0.03
0.04414	-81.9	0.02

T = 32 DEG K

DENSITY G MOL/CM^3	DELTA P ATMX10^3	PCT **
0.00108	0.	0.00
0.00149	0.	0.00
0.00215	-0.5	0.01
0.00256	0.9	0.02
0.00333	-0.8	0.01
0.00398	0.8	0.01
0.00496	-1.0	0.01
0.00678	1.0	0.01
0.00831	-0.5	0.00
* 0.00868	0.	0.00
* 0.02281	-2.3	0.02
0.02383	10.1	0.09
0.02490	6.7	0.05
0.02555	4.0	0.03
0.02622	-14.3	0.09
0.02695	-6.5	0.04
0.02763	6.2	0.03
0.02842	-27.4	0.11
0.02928	29.0	0.10
0.03015	-5.1	0.01
0.03110	25.9	0.06
0.03208	-15.0	0.03
0.03316	-16.0	0.02
0.03378	10.2	0.01
0.03431	-1.9	0.00
0.03487	10.1	0.01
0.03546	-14.3	0.01
0.03611	-33.2	0.03
0.03677	31.8	0.02
0.03773	11.9	0.01
0.03851	24.3	0.01
0.03921	-46.8	0.02
0.03985	27.4	0.01
0.04044	-9.4	0.00
0.04098	-34.9	0.01
0.04150	12.6	0.00
0.04198	34.5	0.01
0.04246	-20.0	0.01

T = 33 DEG K

DENSITY G MOL/CM^3	DELTA P ATMX10^3	PCT **
0.00108	0.	0.00
0.00149	-0.2	0.01
0.00215	0.	0.00
0.00256	0.8	0.01
0.00333	-1.1	0.02
0.00398	0.6	0.01
0.00496	-1.0	0.01
0.00678	1.6	0.01
0.00830	-0.1	0.00
0.01015	-1.2	0.01
0.01182	-1.1	0.01
0.01410	-1.3	0.01
0.01513	0.4	0.00
0.01552	2.5	0.02
0.01640	2.2	0.02
0.01812	-1.4	0.01
0.01980	-11.7	0.09
0.02070	-7.4	0.06
0.02162	1.9	0.01
0.02272	8.5	0.06
0.02383	10.2	0.07
0.02489	17.0	0.10
0.02554	8.2	0.04
0.02621	-24.7	0.12
0.02694	-17.6	0.08
0.02762	-5.7	0.02
0.02841	-25.9	0.09
0.02928	24.4	0.07
0.03014	-2.0	0.00
0.03109	21.6	0.04
0.03207	-3.1	0.01
0.03315	-24.3	0.03
0.03377	21.0	0.03
0.03430	3.2	0.00
0.03486	-6.6	0.01
0.03545	-3.9	0.00
0.03610	-43.0	0.03
0.03676	25.0	0.02
0.03772	0.	0.00
0.03850	8.1	0.00
0.03920	26.9	0.01
0.03984	-28.0	0.01
0.04043	-31.4	0.01
0.04097	-28.1	0.01
0.04149	-58.4	0.02
0.04197	13.6	0.00
0.04245	-22.6	0.01

T = 40 DEG K

DENSITY G MOL/CM^3	DELTA P ATMX10^3	PCT **
0.00108	0.1	0.00
0.00149	-0.2	0.00
0.00215	-0.1	0.00
0.00256	0.4	0.01
0.00332	-0.4	0.00
0.00397	1.4	0.01
0.00496	-1.2	0.01
0.00677	-0.8	0.01
0.00830	-1.3	0.01
0.01013	5.7	0.03
0.01180	-0.2	0.00
0.01408	-6.1	0.02
0.01412	-1.8	0.01
0.01511	1.4	0.01
0.01551	-0.1	0.00
0.01638	-4.5	0.02
0.01638	6.1	0.02
0.01809	0.1	0.00
0.01978	0.3	0.00
0.02068	2.9	0.01
0.02159	5.2	0.01
0.02269	0.8	0.00
0.02379	-4.9	0.01
0.02485	5.4	0.01
0.02550	-5.3	0.01
0.02617	-17.8	0.03
0.02690	-7.2	0.01
0.02758	3.9	0.01
0.02836	14.6	0.02
0.02923	28.2	0.04
0.03008	0.3	0.00
0.03103	-38.1	0.04
0.03202	13.7	0.01
0.03309	-40.2	0.03
0.03371	49.2	0.04
0.03424	30.6	0.02
0.03480	-39.6	0.03
0.03539	5.6	0.00
0.03603	-23.9	0.01
0.03670	2.5	0.00
0.03765	32.8	0.01
0.03843	7.0	0.00
0.03914	-61.7	0.02
0.03977	50.7	0.02
0.04037	-13.3	0.00

T = 50 DEG K

DENSITY G MOL/CM^3	DELTA P ATMX10^3	PCT **
0.00108	0.	0.00
0.00149	0.	0.00
0.00215	0.1	0.00
0.00255	0.	0.00
0.00332	-0.6	0.01
0.00397	0.7	0.01
0.00495	0.2	0.00
0.00676	-0.5	0.00
0.00828	-0.4	0.00
0.01012	0.2	0.00
0.01179	0.	0.00
0.01409	0.1	0.00
0.01509	2.4	0.01
0.01635	-0.5	0.00
0.01806	-2.4	0.00
0.01974	-0.6	0.00
0.02064	1.2	0.00
0.02155	0.3	0.00
0.02264	-1.4	0.00
0.02374	5.5	0.01
0.02480	-19.5	0.02
0.02545	4.2	0.00
0.02611	7.4	0.01
0.02684	2.9	0.00
0.02752	-29.8	0.03
0.02830	71.4	0.06
0.02916	-6.9	0.01
0.03002	-9.3	0.01
0.03096	-39.8	0.03
0.03194	-9.2	0.01
0.03301	-59.2	0.03
0.03363	75.4	0.04
0.03416	50.9	0.02
0.03472	-59.7	0.03
0.03531	82.7	0.03
0.03595	-34.6	0.01
0.03662	-61.5	0.02
0.03757	30.3	0.01

T = 70 DEG K

DENSITY G MOL/CM^3	DELTA P ATMX10^3	PCT **
0.00107	-0.2	0.00
0.00148	0.6	0.01
0.00214	-0.4	0.00
0.00255	-0.5	0.00
0.00331	0.	0.00
0.00396	-0.5	0.00
0.00494	1.0	0.00
0.00675	1.9	0.01
0.00826	0.5	0.00
0.01009	-3.7	0.01
0.01175	-1.9	0.00
0.01405	-1.0	0.00
0.01504	0.4	0.00
0.01630	1.2	0.00
0.01800	3.8	0.00
0.01967	3.5	0.00
0.02057	8.9	0.01
0.02147	-0.2	0.00
0.02256	-0.4	0.00
0.02365	-5.1	0.00
0.02471	-9.5	0.01
0.02535	-7.8	0.00
0.02601	-7.9	0.00
0.02674	-7.2	0.00
0.02741	-79.6	0.04
0.02818	95.3	0.04
0.02904	36.9	0.02
0.02990	44.0	0.02
0.03084	-66.4	0.02
0.03181	30.7	0.01
0.03288	-153.4	0.05
0.03350	145.5	0.04
0.03403	-28.8	0.01

* SATURATION DENSITY
** ABSOLUTE VALUE

TABLE III. COEFFICIENTS A_i FOR ISOCHORES IN EQUATION (2)

DENSITY	A1	A2	A3	A4	A5
0.0005	$-8.0377310 \times 10^{-7}$	4.1671141×10^{-2}	$-5.7318471 \times 10^{-2}$	$-3.4852970 \times 10^{-1}$	1.0761355×10^{0}
0.0010	1.2281445×10^{-6}	8.3815085×10^{-2}	$-1.8093034 \times 10^{-1}$	-2.3328599×10^{0}	9.0125519×10^{0}
0.0015	$-2.1059322 \times 10^{-6}$	1.2820967×10^{-1}	$-4.9784230 \times 10^{-1}$	-2.0682478×10^{0}	-1.6858820×10^{1}
0.0020	$-3.8373024 \times 10^{-6}$	1.7331713×10^{-1}	$-8.8737394 \times 10^{-1}$	-3.2165717×10^{0}	-3.7102804×10^{1}
0.0025	$-8.7732374 \times 10^{-6}$	2.2031547×10^{-1}	-1.4439885×10^{0}	-2.6094543×10^{0}	-8.6642049×10^{1}
0.0030	$-1.5259414 \times 10^{-5}$	2.6879575×10^{-1}	-2.1308185×10^{0}	-1.2407244×10^{0}	-1.5703564×10^{2}
0.0035	$-2.6335328 \times 10^{-5}$	3.1955518×10^{-1}	-3.0135132×10^{0}	3.2160865×10^{0}	-2.7513041×10^{2}
0.0040	$-4.1334596 \times 10^{-5}$	3.7255940×10^{-1}	-4.0968010×10^{0}	1.1342612×10^{1}	-4.5130837×10^{2}
0.0045	$-6.5248416 \times 10^{-5}$	4.2889084×10^{-1}	-5.4553331×10^{0}	2.5378825×10^{1}	-7.0776183×10^{2}
0.0050	$-9.5611221 \times 10^{-5}$	4.8814042×10^{-1}	-7.0653434×10^{0}	4.4994254×10^{1}	-1.0446450×10^{3}
0.0055	$-1.3180607 \times 10^{-4}$	5.5015638×10^{-1}	-8.9079311×10^{0}	6.9446852×10^{1}	-1.4487078×10^{3}
0.0060	$-1.7026696 \times 10^{-4}$	6.1401927×10^{-1}	-1.0891583×10^{1}	9.5141850×10^{1}	-1.8692702×10^{3}
0.0065	$-2.1873437 \times 10^{-4}$	6.8175290×10^{-1}	-1.3194912×10^{1}	1.2866170×10^{2}	-2.3880154×10^{3}
0.0070	$-2.5922335 \times 10^{-4}$	7.4882307×10^{-1}	-1.5409693×10^{1}	1.5495204×10^{2}	-2.8067078×10^{3}
0.0075	$-3.1173105 \times 10^{-4}$	8.2030192×10^{-1}	-1.7982500×10^{1}	1.9055501×10^{2}	-3.3410802×10^{3}
0.0080	$-3.6397233 \times 10^{-4}$	8.9316323×10^{-1}	-2.0641264×10^{1}	2.2540166×10^{2}	-3.8559030×10^{3}
0.0085	$-4.2257714 \times 10^{-4}$	9.6889537×10^{-1}	-2.3494803×10^{1}	2.6281975×10^{2}	-4.3843916×10^{3}
0.0090	$-4.5541749 \times 10^{-4}$	1.0395381×10^{0}	-2.5827529×10^{1}	2.7566446×10^{2}	-4.5542515×10^{3}
0.0095	$-5.0527305 \times 10^{-4}$	1.1158471×10^{0}	-2.8601520×10^{1}	3.0073723×10^{2}	-4.8694049×10^{3}
0.0100	$-5.4852158 \times 10^{-4}$	1.1918611×10^{0}	-3.1270310×10^{1}	3.1701581×10^{2}	-5.0390446×10^{3}
0.0105	$-5.8649584 \times 10^{-4}$	1.2680118×10^{0}	-3.3868301×10^{1}	3.2576079×10^{2}	-5.0769555×10^{3}
0.0110	$-6.1718419 \times 10^{-4}$	1.3436317×10^{0}	-3.6312903×10^{1}	3.2333676×10^{2}	-4.9279847×10^{3}
0.0115	$-6.4380987 \times 10^{-4}$	1.4195863×10^{0}	-3.8676869×10^{1}	3.1249379×10^{2}	-4.6275005×10^{3}
0.0120	$-6.5827104 \times 10^{-4}$	1.4938576×10^{0}	-4.0770123×10^{1}	2.8602308×10^{2}	-4.0775766×10^{3}
0.0125	$-6.5781804 \times 10^{-4}$	1.5657673×10^{0}	-4.2521120×10^{1}	2.4109665×10^{2}	-3.2393895×10^{3}

TABLE III. COEFFICIENTS A_i FOR ISOCHORES IN EQUATION (2)-CONTINUED

DENSITY	A1	A2	A3	A4	A5
0.0130	$-6.4924148 \times 10^{-4}$	1.6369293×10^{0}	-4.4057432×10^{1}	1.8228715×10^{2}	-2.1710548×10^{3}
0.0135	$-6.2883272 \times 10^{-4}$	1.7064442×10^{0}	-4.5291856×10^{1}	1.0647785×10^{2}	-8.3495872×10^{2}
0.0140	$-5.9352177 \times 10^{-4}$	1.7737101×10^{0}	-4.6171278×10^{1}	1.1968543×10^{1}	7.8810918×10^{2}
0.0145	$-5.5021366 \times 10^{-4}$	1.8403582×10^{0}	-4.6823811×10^{1}	-9.6472164×10^{1}	2.6316170×10^{3}
0.0150	$-4.9570493 \times 10^{-4}$	1.9056878×10^{0}	-4.7185354×10^{1}	-2.2083220×10^{2}	4.7142330×10^{3}
0.0155	$-4.3643903 \times 10^{-4}$	1.9713662×10^{0}	-4.7400820×10^{1}	-3.5521484×10^{2}	6.9491255×10^{3}
0.0160	$-3.7869989 \times 10^{-4}$	2.0390411×10^{0}	-4.7608307×10^{1}	-4.9429203×10^{2}	9.2604127×10^{3}
0.0165	$-3.2988888 \times 10^{-4}$	2.1107021×10^{0}	-4.7991765×10^{1}	-6.3011102×10^{2}	1.1524025×10^{4}
0.0170	$-2.9135311 \times 10^{-4}$	2.1868961×10^{0}	-4.8607001×10^{1}	-7.5967443×10^{2}	1.3685515×10^{4}
0.0175	$-2.7009731 \times 10^{-4}$	2.2692860×10^{0}	-4.9585045×10^{1}	-8.7793619×10^{2}	1.5672403×10^{4}
0.0180	$-2.7696572 \times 10^{-4}$	2.3605869×10^{0}	-5.1154888×10^{1}	-9.7611348×10^{2}	1.7362219×10^{4}
0.0185	$-2.9812312 \times 10^{-4}$	2.4577571×10^{0}	-5.3068125×10^{1}	-1.0620580×10^{3}	1.8840761×10^{4}
0.0190	$-3.5004592 \times 10^{-4}$	2.5647236×10^{0}	-5.5648849×10^{1}	-1.1236298×10^{3}	1.9943022×10^{4}
0.0195	$-4.2455082 \times 10^{-4}$	2.6795942×10^{0}	-5.8727770×10^{1}	-1.1665448×10^{3}	2.0737451×10^{4}
0.0200	$-5.2401202 \times 10^{-4}$	2.8029003×10^{0}	-6.2332962×10^{1}	-1.1896026×10^{3}	2.1205585×10^{4}
0.0205	$-6.4125592 \times 10^{-4}$	2.9331360×10^{0}	-6.6339776×10^{1}	-1.1965205×10^{3}	2.1388423×10^{4}
0.0210	$-7.8212495 \times 10^{-4}$	3.0713863×10^{0}	-7.0798392×10^{1}	-1.1861179×10^{3}	2.1278368×10^{4}
0.0215	$-9.3448052 \times 10^{-4}$	3.2149294×10^{0}	-7.5474072×10^{1}	-1.1663516×10^{3}	2.0977596×10^{4}
0.0220	$-1.0934784 \times 10^{-3}$	3.3623746×10^{0}	-8.0216248×10^{1}	-1.1427383×10^{3}	2.0559050×10^{4}
0.0225	$-1.2559322 \times 10^{-3}$	3.5129883×10^{0}	-8.4945172×10^{1}	-1.1180923×10^{3}	2.0065004×10^{4}
0.0230	$-1.3698538 \times 10^{-3}$	3.6532274×10^{0}	-8.8378554×10^{1}	-1.1428658×10^{3}	2.0212248×10^{4}
0.0235	$-1.5478358 \times 10^{-3}$	3.8122308×10^{0}	-9.3209590×10^{1}	-1.1103218×10^{3}	1.9492025×10^{4}
0.0240	$-1.7219023 \times 10^{-3}$	3.9723517×10^{0}	-9.7775742×10^{1}	-1.0857529×10^{3}	1.8829911×10^{4}
0.0245	$-1.8920438 \times 10^{-3}$	4.1335542×10^{0}	-1.0205513×10^{2}	-1.0696396×10^{3}	1.8237987×10^{4}
0.0250	$-2.0561721 \times 10^{-3}$	4.2953206×10^{0}	-1.0598185×10^{2}	-1.0641185×10^{3}	1.7749108×10^{4}

TABLE III. COEFFICIENTS A_i FOR ISOCHORES IN EQUATION (2)-CONTINUED

DENSITY	A1	A2	A3	A4	A5
0.0255	$-2.2143473 \times 10^{-3}$	4.4572955×10^{0}	-1.0947043×10^{2}	-1.0733223×10^{3}	1.7442580×10^{4}
0.0260	$-2.4177387 \times 10^{-3}$	4.6326102×10^{0}	-1.1370972×10^{2}	-1.0504141×10^{3}	1.6669838×10^{4}
0.0265	$-2.6272401 \times 10^{-3}$	4.8109381×10^{0}	-1.1770864×10^{2}	-1.0340018×10^{3}	1.5978421×10^{4}
0.0270	$-2.8407149 \times 10^{-3}$	4.9917539×10^{0}	-1.2139729×10^{2}	-1.0264770×10^{3}	1.5412988×10^{4}
0.0275	$-2.9235301 \times 10^{-3}$	5.1482192×10^{0}	-1.2287832×10^{2}	-1.0823485×10^{3}	1.5529079×10^{4}
0.0280	$-3.2097408 \times 10^{-3}$	5.3505627×10^{0}	-1.2737635×10^{2}	-1.0365624×10^{3}	1.4476561×10^{4}
0.0285	$-3.4133869 \times 10^{-3}$	5.5385032×10^{0}	-1.3032203×10^{2}	-1.0349302×10^{3}	1.3941732×10^{4}
0.0290	$-3.4292715 \times 10^{-3}$	5.6917803×10^{0}	-1.3031157×10^{2}	-1.1172453×10^{3}	1.4340021×10^{4}
0.0295	$-4.0583221 \times 10^{-3}$	5.9679756×10^{0}	-1.3843027×10^{2}	-9.5022563×10^{2}	1.2070660×10^{4}
0.0300	$-4.0351868 \times 10^{-3}$	6.1196071×10^{0}	-1.3730741×10^{2}	-1.0518802×10^{3}	1.2720182×10^{4}
0.0305	$-5.2023678 \times 10^{-3}$	6.4955823×10^{0}	-1.5065102×10^{2}	-7.3317710×10^{2}	9.0641995×10^{3}
0.0310	$-5.5757572 \times 10^{-3}$	6.7236159×10^{0}	-1.5333181×10^{2}	-7.1729678×10^{2}	8.6428251×10^{3}
0.0315	$-6.2069722 \times 10^{-3}$	7.0008332×10^{0}	-1.5864047×10^{2}	-6.1916306×10^{2}	7.4271301×10^{3}
0.0320	$-6.8678927 \times 10^{-3}$	7.2845818×10^{0}	-1.6366492×10^{2}	-5.2271128×10^{2}	6.3105084×10^{3}
0.0325	$-7.1803709 \times 10^{-3}$	7.5091781×10^{0}	-1.6426362×10^{2}	-5.3825987×10^{2}	6.3673451×10^{3}
0.0330	$-7.6073285 \times 10^{-3}$	7.7573489×10^{0}	-1.6578472×10^{2}	-5.1531466×10^{2}	6.0708932×10^{3}
0.0335	$-7.9515444 \times 10^{-3}$	7.9939722×10^{0}	-1.6593847×10^{2}	-5.1639302×10^{2}	6.0532802×10^{3}
0.0340	$-9.1273819 \times 10^{-3}$	8.3571042×10^{0}	-1.7221788×10^{2}	-3.6579871×10^{2}	4.8294821×10^{3}
0.0345	$-9.5657506 \times 10^{-3}$	8.6083924×10^{0}	-1.7159915×10^{2}	-3.6543501×10^{2}	4.9320575×10^{3}
0.0350	$-1.1015059 \times 10^{-2}$	9.0096826×10^{0}	-1.7825786×10^{2}	-1.8416297×10^{2}	3.5624987×10^{3}
0.0355	$-1.1959132 \times 10^{-2}$	9.3389942×10^{0}	-1.8042763×10^{2}	-8.7846858×10^{1}	2.9059444×10^{3}
0.0360	$-1.3886189 \times 10^{-2}$	9.8044979×10^{0}	-1.8864278×10^{2}	1.5419294×10^{2}	1.1351017×10^{3}
0.0365	$-1.5505519 \times 10^{-2}$	1.0229200×10^{1}	-1.9410328×10^{2}	3.5588009×10^{2}	-3.1705787×10^{2}
0.0370	$-1.7400006 \times 10^{-2}$	1.0686035×10^{1}	-2.0004923×10^{2}	5.7942490×10^{2}	-1.8692257×10^{3}
0.0375	$-2.0124586 \times 10^{-2}$	1.1241795×10^{1}	-2.0932852×10^{2}	8.7722455×10^{2}	-3.8552011×10^{3}

TABLE III. COEFFICIENTS A_i FOR ISOCHORES IN EQUATION (2)-CONTINUED

DENSITY	A1	A2	A3	A4	A5
0.0380	$-2.2408441 \times 10^{-2}$	1.1740489×10^{1}	-2.1504047×10^{2}	1.1212214×10^{3}	-5.4197643×10^{3}
0.0385	$-2.3006439 \times 10^{-2}$	1.2016333×10^{1}	-2.0928329×10^{2}	1.1541824×10^{3}	-5.4462613×10^{3}
0.0390	$-2.3612257 \times 10^{-2}$	1.2275667×10^{1}	-2.0118944×10^{2}	1.1518611×10^{3}	-5.1573924×10^{3}
0.0395	$-2.1131850 \times 10^{-2}$	1.2205924×10^{1}	-1.7942589×10^{2}	9.4203092×10^{2}	-3.6215951×10^{3}
0.0400	$-1.5787078 \times 10^{-2}$	1.1833711×10^{1}	-1.4498536×10^{2}	5.4030442×10^{2}	-9.1656659×10^{2}
0.0405	$-7.2297747 \times 10^{-3}$	1.1143704×10^{1}	-9.8067031×10^{1}	-3.5545003×10^{1}	2.7670921×10^{3}
0.0410	$-1.1157932 \times 10^{-2}$	1.1728386×10^{1}	-9.7440413×10^{1}	1.5041468×10^{2}	2.0174573×10^{3}
0.0415	2.0572108×10^{-4}	1.0774412×10^{1}	-3.8944428×10^{1}	-5.6987252×10^{2}	6.5948069×10^{3}
0.0420	9.1201507×10^{-3}	1.0186019×10^{1}	2.2018214×10^{0}	-8.9772310×10^{2}	8.2338889×10^{3}
0.0425	$-3.6886842 \times 10^{-2}$	1.4999411×10^{1}	-1.5324378×10^{2}	1.9715175×10^{3}	-9.3307466×10^{3}
0.0430	$-2.5967306 \times 10^{-1}$	3.7406308×10^{1}	-9.6215597×10^{2}	1.5643871×10^{4}	-9.3572403×10^{4}
0.0435	2.0399673×10^{-2}	1.0508182×10^{1}	3.6778774×10^{1}		
0.0440	4.1266163×10^{-2}	9.6191112×10^{0}	7.2762252×10^{1}		
0.0445	6.8570651×10^{-2}	8.3929369×10^{0}	1.1458652×10^{2}		
0.0450	1.4766631×10^{-1}	4.3831287×10^{0}	1.9525322×10^{2}		

TABLE IV. REPRESENTATIVE DEVIATIONS FOR SELECTED ISOCHORES

DENSITY = 0.0050

	T	DELTA P		
	DEG-K	ATMX10	3 PCT	**
*	29.626	-1	0.01	
	30.	-1	0.01	
	31.	-1	0.01	
	32.	1	0.01	
	33.	1	0.01	
	34.	1	0.01	
	35.	1	0.01	
	36.	0	0.00	
	37.	0	0.00	
	38.	0	0.00	
	39.	-1	0.00	
	40.	0	0.00	
	42.	0	0.00	
	44.	-2	0.01	
	46.	-1	0.01	
	48.	-1	0.01	
	50.	-1	0.00	
	55.	1	0.01	
	60.	0	0.00	
	65.	3	0.01	
	70.	2	0.01	
	75.	-2	0.01	
	80.	-2	0.01	
	85.	-4	0.01	
	90.	1	0.00	
	95.	3	0.01	
	100.	-1	0.00	

DENSITY = 0.0100

	T	DELTA P		
	DEG-K	ATMX10	3 PCT	**
*	32.430	-12	0.10	
	33.	-1	0.01	
	34.	6	0.05	
	35.	8	0.05	
	36.	6	0.04	
	37.	4	0.02	
	38.	2	0.01	
	39.	0	0.00	
	40.	-1	0.01	
	42.	-7	0.03	
	44.	-6	0.02	
	46.	-5	0.02	
	48.	-5	0.02	
	50.	-1	0.00	
	55.	4	0.01	
	60.	4	0.01	
	65.	9	0.02	
	70.	7	0.01	
	75.	-8	0.01	
	80.	-10	0.02	
	85.	-4	0.01	
	90.	7	0.01	
	95.	2	0.00	
	100.	-1	0.00	

DENSITY = 0.0150

	T	DELTA P		
	DEG-K	ATMX10	3 PCT	**
*	32.975	3	0.02	
	33.	0	0.00	
	34.	-1	0.01	
	35.	-3	0.02	
	36.	-2	0.01	
	37.	-2	0.01	
	38.	0	0.00	
	39.	0	0.00	
	40.	2	0.01	
	42.	6	0.02	
	44.	3	0.01	
	46.	-4	0.01	
	48.	-2	0.00	
	50.	-2	0.00	
	55.	0	0.00	
	60.	-4	0.01	
	65.	3	0.00	
	70.	8	0.01	
	75.	0	0.00	
	80.	-4	0.00	
	85.	-6	0.01	
	90.	-1	0.00	
	95.	10	0.01	
	100.	-4	0.00	

DENSITY = 0.0200

	T	DELTA P		
	DEG-K	ATMX10	3 PCT	**
*	32.707	33	0.27	
	33.	31	0.24	
	34.	-29	0.18	
	35.	-35	0.19	
	36.	-29	0.14	
	37.	-17	0.07	
	38.	-6	0.02	
	39.	3	0.01	
	40.	6	0.02	
	42.	20	0.05	
	44.	26	0.06	
	46.	16	0.03	
	48.	12	0.02	
	50.	5	0.01	
	55.	-10	0.01	
	60.	-27	0.03	
	65.	-11	0.01	
	70.	1	0.00	
	75.	0	0.00	
	80.	-9	0.01	
	85.	4	0.00	
	90.	33	0.02	
	95.	4	0.00	
	100.	-20	0.01	

DENSITY = 0.0250

	T	DELTA P		
	DEG-K	ATMX10	3 PCT	**
*	31.050	30	0.31	
	32.	-2	0.02	
	33.	-25	0.14	
	34.	-17	0.08	
	35.	-10	0.04	
	36.	-5	0.02	
	37.	0	0.00	
	38.	5	0.01	
	39.	8	0.02	
	40.	13	0.03	
	42.	13	0.02	
	44.	5	0.01	
	46.	3	0.00	
	48.	-2	0.00	
	50.	-7	0.01	
	55.	-2	0.00	
	60.	-10	0.01	
	65.	3	0.00	
	70.	16	0.01	
	75.	-18	0.01	
	80.	-19	0.01	
	85.	-1	0.00	
	90.	28	0.01	
	95.	20	0.01	
	100.	-24	0.01	

DENSITY = 0.0300

	T	DELTA P		
	DEG-K	ATMX10	3 PCT	**
*	27.270	-31	0.60	
	28.	7	0.08	
	29.	24	0.15	
	30.	7	0.03	
	31.	9	0.03	
	32.	7	0.02	
	33.	4	0.01	
	34.	-8	0.02	
	35.	-9	0.02	
	36.	-5	0.01	
	37.	-2	0.00	
	38.	0	0.00	
	39.	-2	0.00	
	40.	-6	0.01	
	42.	-8	0.01	
	44.	0	0.00	
	46.	-8	0.01	
	48.	5	0.00	
	50.	5	0.00	
	55.	5	0.00	
	60.	-4	0.00	
	65.	31	0.01	
	70.	15	0.01	
	75.	-13	0.00	
	80.	-68	0.02	
	85.	46	0.01	

DENSITY = 0.0350

	T	DELTA P		
	DEG-K	ATMX10	3 PCT	**
*	20.469	10	0.91	
	21.	-17	0.32	
	22.	2	0.01	
	23.	-14	0.06	
	24.	5	0.02	
	25.	21	0.05	
	26.	20	0.04	
	27.	7	0.01	
	28.	11	0.02	
	29.	-4	0.01	
	30.	-10	0.01	
	31.	-22	0.03	
	32.	-28	0.03	
	33.	-6	0.01	
	34.	-22	0.02	
	35.	-9	0.01	
	36.	3	0.00	
	37.	3	0.00	
	38.	17	0.01	
	39.	17	0.01	
	40.	32	0.02	
	42.	23	0.01	
	44.	-4	0.00	
	46.	-1	0.00	
	48.	-25	0.01	
	50.	-10	0.00	
	55.	-8	0.00	
	60.	11	0.00	

DENSITY = 0.0400

	T	DELTA P		
	DEG-K	ATMX10	3 PCT	**
*	16.013	14	0.02	
	17.	4	0.00	
	18.	-58	0.06	
	19.	13	0.01	
	20.	33	0.03	
	21.	1	0.00	
	22.	16	0.01	
	23.	-14	0.01	
	24.	-9	0.01	
	25.	-7	0.00	
	26.	-2	0.00	
	27.	17	0.01	
	28.	11	0.01	
	29.	11	0.01	
	30.	21	0.01	
	31.	-29	0.01	
	32.	-49	0.02	
	33.	-24	0.01	
	34.	9	0.00	
	35.	25	0.01	
	36.	13	0.00	
	37.	13	0.00	
	38.	-12	0.00	
	39.	-3	0.00	
	40.	31	0.01	
	42.	-24	0.01	

* SATURATION TEMPERATURE
** ABSOLUTE VALUE

TABLE IX. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, SATURATED LIQUID AND SATURATED VAPOR *

TEMPERATURE DEG. KELVIN	PRESSURE ATM	VOLUME $CM^3/GMOLE$	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
13.803	0.069_5	26.17	23328.	9.403	-622.9	-622.7	10.00	9.50	13.13	1273
13.803	0.069_5	16056.81	1098.	0.005	169.8	282.8	75.63	12.52	21.20	305
14.	0.077_8	26.23	22864.	9.370	-620.3	-620.1	10.19	9.56	13.31	1264
14.	0.077_8	14519.41	1110.	0.006	172.0	286.5	74.96	12.52	21.24	307
15.	0.133	26.53	21360.	9.132	-606.5	-606.2	11.14	9.90	14.08	1235
15.	0.133	9049.48	1170.	0.009	182.9	304.6	71.86	12.58	21.51	317
16.	0.213	26.84	19950.	8.919	-592.0	-591.4	12.08	10.26	14.92	1207
16.	0.213	5955.49	1223.	0.014	193.2	321.7	69.15	12.65	21.87	325
17.	0.325	27.18	18327.	8.746	-576.6	-575.7	13.01	10.61	15.92	1175
17.	0.325	4096.06	1267.	0.020	202.9	337.8	66.75	12.74	22.31	333
18.	0.476	27.54	16910.	8.589	-560.2	-558.9	13.95	10.94	16.98	1148
18.	0.476	2920.83	1302.	0.029	211.9	352.7	64.60	12.84	22.86	341
19.	0.673	27.93	15663.	8.423	-542.9	-541.0	14.88	11.24	18.05	1124
19.	0.673	2145.87	1326.	0.040	220.0	366.2	62.64	12.96	23.51	347
20.	0.923	28.36	14525.	8.252	-524.6	-521.9	15.83	11.51	19.15	1102
20.	0.923	1616.07	1340.	0.053	227.2	378.3	60.85	13.08	24.28	353
20.268	1.000	28.48	14091.	8.204	-519.5	-516.6	16.08	11.57	19.53	1093
20.268	1.000	1506.86	1343.	0.057	229.0	381.7	60.41	13.11	24.50	355
21.	1.233	28.82	13123.	8.057	-505.1	-501.5	16.78	11.74	20.49	1072
21.	1.233	1245.28	1344.	0.070	233.5	389.1	59.21	13.20	25.18	358
22.	1.613	29.34	11914.	7.842	-484.5	-479.7	17.74	11.94	21.84	1046
22.	1.613	973.39	1333.	0.090	238.5	397.6	57.64	13.33	26.27	363
23.	2.069	29.90	10507.	7.583	-462.6	-456.3	18.72	12.11	23.51	1012
23.	2.069	771.82	1310.	0.115	242.3	404.2	56.15	13.46	27.59	367
24.	2.611	30.54	9273.	7.291	-439.3	-431.2	19.72	12.25	25.25	980
24.	2.611	619.37	1272.	0.146	244.7	408.5	54.73	13.59	29.22	370
25.	3.245	31.26	8021.	6.965	-414.5	-404.2	20.74	12.37	27.35	943
25.	3.245	501.85	1219.	0.183	245.4	410.4	53.34	13.74	31.28	373
26.	3.982	32.08	6810.	6.591	-387.9	-374.9	21.79	12.49	29.79	903
26.	3.982	409.62	1149.	0.228	244.1	409.4	51.98	13.90	33.98	375
27.	4.829	33.04	5613.	6.182	-359.3	-343.1	22.89	12.61	32.94	858
27.	4.829	336.00	1061.	0.284	240.5	404.9	50.61	14.09	37.62	377
28.	5.794	34.19	4425.	5.736	-328.3	-308.2	24.04	12.74	37.39	807
28.	5.794	276.24	954.	0.354	234.0	396.1	49.21	14.34	42.82	378
29.	6.887	35.59	3339.	5.253	-294.2	-269.3	25.27	12.89	43.64	753
29.	6.887	226.85	823.	0.443	223.7	382.0	47.74	14.67	50.79	378
30.	8.118	37.38	2300.	4.720	-255.9	-225.1	26.61	13.07	54.20	692
30.	8.118	185.17	665.	0.561	208.1	360.4	46.14	15.12	64.50	377
31.	9.501	39.85	1376.	4.118	-211.3	-172.9	28.15	13.33	74.81	623
31.	9.501	148.88	471.	0.727	184.4	327.7	44.30	15.77	93.87	375
32.	11.051	43.83	593.	3.393	-154.4	-105.3	30.08	13.79	134.66	539
32.	11.051	115.21	256.	0.977	145.3	274.3	41.95	16.47	176.84	371
32.976	12.759	64.14		1.874	-5.3	77.6	35.42	19.88		349
32.976	12.759	64.14		1.874	-6.2	76.7	35.40	19.66		351

* THE FIRST ENTRY FOR EACH TEMPERATURE PERTAINS TO THE SATURATED LIQUID

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS

0.07 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 13.816	26.18	23125.	9.400	-622.7	-622.6	10.01	9.50	13.17	1269
* 13.816	15949.	1098.	0.005	170.0	283.1	75.58	12.52	21.20	306
14	16167.	1114.	0.005	172.3	287.0	75.86	12.51	21.19	308
15	17362.	1200.	0.005	185.0	308.1	77.32	12.50	21.11	319
16	18554.	1285.	0.004	197.6	329.2	78.68	12.50	21.06	330
17	19743.	1369.	0.004	210.2	350.3	79.96	12.49	21.03	340
18	20930.	1453.	0.004	222.8	371.3	81.16	12.49	21.00	350
19	22114.	1537.	0.004	235.4	392.3	82.29	12.49	20.97	360
20	23298.	1621.	0.004	248.0	413.2	83.37	12.49	20.95	370
21	24480.	1704.	0.003	260.5	434.2	84.39	12.49	20.93	379
22	25661.	1787.	0.003	273.1	455.1	85.36	12.49	20.92	388
23	26842.	1870.	0.003	285.6	476.0	86.29	12.48	20.91	397
24	28021.	1954.	0.003	298.2	496.9	87.18	12.48	20.90	405
25	29200.	2037.	0.003	310.7	517.8	88.04	12.48	20.89	414
26	30379.	2119.	0.003	323.2	538.7	88.86	12.48	20.88	422
27	31557.	2202.	0.003	335.7	559.6	89.64	12.48	20.87	430
28	32734.	2285.	0.003	348.3	580.4	90.40	12.48	20.86	438
29	33911.	2368.	0.002	360.8	601.3	91.13	12.48	20.86	446
30	35088.	2450.	0.002	373.3	622.1	91.84	12.48	20.85	454
31	36264.	2533.	0.002	385.8	643.0	92.53	12.48	20.85	461
32	37440.	2616.	0.002	398.3	663.8	93.19	12.48	20.85	469
33	38616.	2698.	0.002	410.8	684.7	93.83	12.48	20.84	476
34	39791.	2781.	0.002	423.3	705.5	94.45	12.48	20.84	483
35	40967.	2863.	0.002	435.8	726.4	95.06	12.48	20.84	490
36	42142.	2946.	0.002	448.3	747.2	95.64	12.48	20.84	497
37	43317.	3028.	0.002	460.8	768.1	96.21	12.49	20.84	504
38	44492.	3111.	0.002	473.3	788.9	96.77	12.49	20.84	511
39	45666.	3193.	0.002	485.8	809.7	97.31	12.49	20.84	517
40	46841.	3275.	0.002	498.3	830.6	97.84	12.50	20.84	524
41	48015.	3358.	0.002	510.9	851.4	98.35	12.50	20.84	530
42	49190.	3440.	0.002	523.4	872.3	98.85	12.51	20.85	537
43	50364.	3522.	0.002	535.9	893.1	99.35	12.52	20.86	543
44	51538.	3605.	0.002	548.4	914.0	99.83	12.53	20.87	549
45	52712.	3687.	0.002	561.0	934.8	100.29	12.54	20.88	555
46	53886.	3769.	0.002	573.5	955.7	100.75	12.55	20.89	561
47	55060.	3852.	0.001	586.1	976.6	101.20	12.57	20.91	567
48	56233.	3934.	0.001	598.7	997.5	101.64	12.59	20.92	573
49	57407.	4016.	0.001	611.3	1018.5	102.07	12.61	20.94	579
50	58581.	4098.	0.001	623.9	1039.4	102.50	12.64	20.97	585
51	59754.	4181.	0.001	636.6	1060.4	102.91	12.66	21.00	590
52	60928.	4263.	0.001	649.3	1081.4	103.32	12.70	21.03	596
53	62101.	4345.	0.001	662.0	1102.5	103.72	12.73	21.06	601
54	63275.	4427.	0.001	674.8	1123.6	104.12	12.77	21.10	606
55	64448.	4509.	0.001	687.6	1144.7	104.50	12.81	21.14	612
56	65621.	4592.	0.001	700.4	1165.8	104.89	12.86	21.19	617
57	66795.	4674.	0.001	713.3	1187.1	105.26	12.91	21.24	622
58	67968.	4756.	0.001	726.2	1208.3	105.63	12.96	21.29	627
59	69141.	4838.	0.001	739.2	1229.6	105.99	13.02	21.35	631
60	70314.	4920.	0.001	752.3	1251.0	106.35	13.09	21.41	636
61	71487.	5003.	0.001	765.4	1272.5	106.71	13.15	21.48	641
62	72661.	5085.	0.001	778.6	1294.0	107.06	13.23	21.55	645
63	73834.	5167.	0.001	791.9	1315.6	107.40	13.30	21.63	650
64	75007.	5249.	0.001	805.2	1337.2	107.75	13.39	21.71	654
65	76180.	5331.	0.001	818.7	1359.0	108.08	13.47	21.80	658
66	77353.	5413.	0.001	832.2	1380.9	108.42	13.57	21.89	663
67	78526.	5496.	0.001	845.8	1402.8	108.75	13.66	21.99	667
68	79699.	5578.	0.001	859.5	1424.8	109.07	13.76	22.09	671
69	80872.	5660.	0.001	873.4	1447.0	109.40	13.87	22.19	675
70	82044.	5742.	0.001	887.3	1469.2	109.72	13.98	22.30	679
71	83217.	5824.	0.001	901.3	1491.6	110.03	14.09	22.42	682
72	84390.	5906.	0.001	915.5	1514.1	110.35	14.21	22.54	686
73	85563.	5988.	0.001	929.8	1536.7	110.66	14.34	22.66	690
74	86736.	6071.	0.001	944.2	1559.4	110.97	14.46	22.79	693
75	87909.	6153.	0.001	958.7	1582.2	111.28	14.60	22.92	697
76	89082.	6235.	0.001	973.4	1605.2	111.58	14.73	23.05	700
77	90254.	6317.	0.001	988.2	1628.3	111.88	14.87	23.19	704
78	91427.	6399.	0.001	1003.1	1651.6	112.18	15.01	23.33	707
79	92600.	6481.	0.001	1018.2	1675.0	112.48	15.16	23.48	710
80	93773.	6563.	0.001	1033.5	1698.6	112.78	15.31	23.63	714
81	94945.	6646.	0.001	1048.9	1722.3	113.07	15.46	23.78	717
82	96118.	6728.	0.001	1064.4	1746.1	113.36	15.62	23.94	720
83	97291.	6810.	0.001	1080.1	1770.2	113.65	15.78	24.10	723
84	98464.	6892.	0.001	1096.0	1794.3	113.94	15.94	24.26	726
85	99636.	6974.	0.001	1112.0	1818.7	114.23	16.10	24.42	729
86	100809.	7056.	0.001	1128.2	1843.2	114.52	16.27	24.59	732
87	101982.	7138.	0.001	1144.5	1867.8	114.80	16.43	24.75	735
88	103154.	7220.	0.001	1161.0	1892.7	115.09	16.60	24.92	738
89	104327.	7302.	0.001	1177.7	1917.7	115.37	16.77	25.09	741
90	105500.	7384.	0.001	1194.6	1942.9	115.65	16.94	25.26	744
91	106672.	7467.	0.001	1211.6	1968.2	115.93	17.12	25.44	747
92	107845.	7549.	0.001	1228.8	1993.7	116.21	17.29	25.61	750
93	109017.	7631.	0.001	1246.2	2019.4	116.49	17.47	25.78	752
94	110190.	7713.	0.001	1263.8	2045.3	116.77	17.64	25.96	755
95	111363.	7795.	0.001	1281.5	2071.4	117.04	17.82	26.13	758
96	112535.	7877.	0.001	1299.4	2097.6	117.32	17.99	26.31	761
97	113708.	7959.	0.001	1317.5	2124.0	117.59	18.17	26.49	764
98	114880.	8041.	0.001	1335.7	2150.6	117.86	18.34	26.66	766
99	116053.	8124.	0.001	1354.2	2177.3	118.13	18.52	26.84	769
100	117226.	8206.	0.001	1372.8	2204.2	118.40	18.69	27.01	772

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

0.08 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
14	26.23	2284a.	9.369	-620.2	-620.0	10.19	9.56	13.31	1264
* 14.049	26.24	2283a.	9.362	-619.6	-619.4	10.24	9.58	13.34	1264
* 14.049	14166.	111a.	0.006	172.6	287.4	74.80	12.53	21.25	308
15	15163.	119a.	0.005	184.7	307.6	76.19	12.51	21.17	319
16	16209.	128a.	0.005	197.3	328.7	77.55	12.50	21.11	330
17	17251.	136a.	0.005	210.0	349.8	78.83	12.50	21.06	340
18	18292.	145a.	0.005	222.6	370.8	80.04	12.49	21.03	350
19	19330.	153a.	0.004	235.2	391.9	81.17	12.49	21.00	360
20	20367.	161a.	0.004	247.8	412.9	82.25	12.49	20.98	370
21	21403.	170a.	0.004	260.3	433.8	83.27	12.49	20.96	379
22	22438.	178a.	0.004	272.9	454.8	84.25	12.49	20.94	388
23	23471.	186a.	0.004	285.4	475.7	85.18	12.49	20.93	397
24	24505.	195a.	0.003	298.0	496.6	86.07	12.49	20.91	405
25	25537.	203a.	0.003	310.5	517.5	86.92	12.48	20.90	414
26	26569.	211a.	0.003	323.1	538.4	87.74	12.48	20.89	422
27	27600.	220a.	0.003	335.6	559.3	88.53	12.48	20.88	430
28	28631.	228a.	0.003	348.1	580.2	89.29	12.48	20.88	438
29	29661.	236a.	0.003	360.6	601.1	90.02	12.48	20.87	446
30	30692.	244a.	0.003	373.2	621.9	90.73	12.48	20.86	454
31	31721.	253a.	0.003	385.7	642.8	91.41	12.48	20.86	461
32	32751.	261a.	0.003	398.2	663.7	92.07	12.48	20.85	469
33	33780.	269a.	0.002	410.7	684.5	92.72	12.48	20.85	476
34	34809.	277a.	0.002	423.2	705.4	93.34	12.48	20.85	483
35	35838.	286a.	0.002	435.7	726.2	93.94	12.48	20.84	490
36	36867.	294a.	0.002	448.2	747.1	94.53	12.48	20.84	497
37	37895.	302a.	0.002	460.7	767.9	95.10	12.49	20.84	504
38	38923.	310a.	0.002	473.2	788.7	95.66	12.49	20.84	511
39	39951.	319a.	0.002	485.7	809.6	96.20	12.49	20.84	517
40	40979.	327a.	0.002	498.2	830.4	96.73	12.50	20.85	524
41	42007.	335a.	0.002	510.8	851.3	97.24	12.50	20.85	530
42	43035.	343a.	0.002	523.3	872.1	97.74	12.51	20.85	537
43	44063.	352a.	0.002	535.8	893.0	98.23	12.52	20.86	543
44	45090.	360a.	0.002	548.4	913.9	98.71	12.53	20.87	549
45	46118.	368a.	0.002	560.9	934.7	99.18	12.54	20.88	555
46	47145.	376a.	0.002	573.5	955.6	99.64	12.55	20.89	561
47	48172.	385a.	0.002	586.0	976.5	100.09	12.57	20.91	567
48	49200.	393a.	0.002	598.6	997.4	100.53	12.59	20.93	573
49	50227.	401a.	0.002	611.2	1018.4	100.96	12.61	20.95	579
50	51254.	409a.	0.002	623.9	1039.3	101.39	12.64	20.97	585
51	52281.	418a.	0.002	636.5	1060.3	101.80	12.66	21.00	590
52	53308.	426a.	0.002	649.2	1081.3	102.21	12.70	21.03	596
53	54335.	434a.	0.002	662.0	1102.4	102.61	12.73	21.06	601
54	55362.	442a.	0.001	674.7	1123.5	103.00	12.77	21.10	606
55	56389.	450a.	0.001	687.5	1144.6	103.39	12.81	21.14	612
56	57415.	459a.	0.001	700.4	1165.8	103.77	12.86	21.19	617
57	58442.	467a.	0.001	713.2	1187.0	104.15	12.91	21.24	622
58	59469.	475a.	0.001	726.2	1208.2	104.52	12.96	21.29	627
59	60495.	483a.	0.001	739.2	1229.6	104.88	13.02	21.35	631
60	61522.	492a.	0.001	752.2	1250.9	105.24	13.09	21.41	636
61	62549.	500a.	0.001	765.4	1272.4	105.60	13.15	21.48	641
62	63575.	508a.	0.001	778.6	1293.9	105.95	13.23	21.55	645
63	64602.	516a.	0.001	791.8	1315.5	106.29	13.30	21.63	650
64	65628.	524a.	0.001	805.2	1337.2	106.63	13.39	21.71	654
65	66655.	533a.	0.001	818.6	1358.9	106.97	13.47	21.80	658
66	67681.	541a.	0.001	832.2	1380.8	107.31	13.57	21.89	663
67	68708.	549a.	0.001	845.8	1402.7	107.64	13.66	21.99	667
68	69734.	557a.	0.001	859.5	1424.8	107.96	13.76	22.09	671
69	70761.	566a.	0.001	873.3	1446.9	108.28	13.87	22.19	675
70	71787.	574a.	0.001	887.3	1469.2	108.61	13.98	22.30	679
71	72813.	582a.	0.001	901.3	1491.5	108.92	14.09	22.42	682
72	73840.	590a.	0.001	915.5	1514.0	109.24	14.21	22.54	686
73	74866.	598a.	0.001	929.7	1536.6	109.55	14.34	22.66	690
74	75892.	607a.	0.001	944.1	1559.3	109.86	14.46	22.79	693
75	76919.	615a.	0.001	958.7	1582.2	110.16	14.60	22.92	697
76	77945.	623a.	0.001	973.3	1605.2	110.47	14.73	23.05	700
77	78971.	631a.	0.001	988.1	1628.3	110.77	14.87	23.19	704
78	79997.	639a.	0.001	1003.1	1651.6	111.07	15.01	23.34	707
79	81024.	648a.	0.001	1018.2	1675.0	111.37	15.16	23.48	710
80	82050.	656a.	0.001	1033.4	1698.5	111.67	15.31	23.63	714
81	83076.	664a.	0.001	1048.8	1722.2	111.96	15.46	23.78	717
82	84102.	672a.	0.001	1064.4	1746.1	112.25	15.62	23.94	720
83	85128.	681a.	0.001	1080.1	1770.1	112.54	15.78	24.10	723
84	86155.	689a.	0.001	1095.9	1794.3	112.83	15.94	24.26	726
85	87181.	697a.	0.001	1111.9	1818.6	113.12	16.10	24.42	729
86	88207.	705a.	0.001	1128.1	1843.1	113.41	16.27	24.59	732
87	89233.	713a.	0.001	1144.5	1867.8	113.69	16.43	24.75	735
88	90259.	722a.	0.001	1161.0	1892.6	113.98	16.60	24.92	738
89	91285.	730a.	0.001	1177.7	1917.7	114.26	16.77	25.09	741
90	92311.	738a.	0.001	1194.6	1942.8	114.54	16.94	25.26	744
91	93338.	746a.	0.001	1211.6	1968.2	114.82	17.12	25.44	747
92	94364.	754a.	0.001	1228.8	1993.7	115.10	17.29	25.61	750
93	95390.	763a.	0.001	1246.2	2019.4	115.38	17.47	25.79	752
94	96416.	771a.	0.001	1263.7	2045.3	115.66	17.64	25.96	755
95	97442.	779a.	0.001	1281.5	2071.3	115.93	17.82	26.14	758
96	98468.	787a.	0.001	1299.4	2097.6	116.21	17.99	26.31	761
97	99494.	795a.	0.001	1317.5	2124.0	116.48	18.17	26.49	764
98	100520.	804a.	0.001	1335.7	2150.5	116.75	18.34	26.66	766
99	101546.	812a.	0.001	1354.1	2177.3	117.02	18.52	26.84	769
100	102572.	820a.	0.001	1372.8	2204.2	117.29	18.69	27.01	772

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

0.10 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 13.804	26.18	23311.	9.402	-622.9	-622.6	10.00	9.50	13.13	1273
14	26.23	22846.	9.369	-620.2	-620.0	10.19	9.56	13.31	1264
* 14.454	26.36	22191.	9.275	-614.1	-613.9	10.62	9.71	13.66	1252
* 14.454	11627.	1138.	0.007	177.0	294.8	73.50	12.55	21.36	312
15	12085.	1186.	0.007	184.0	306.5	74.29	12.53	21.29	318
16	12925.	1272.	0.006	196.7	327.7	75.66	12.52	21.21	329
17	13763.	1358.	0.006	209.4	348.9	76.95	12.51	21.14	340
18	14598.	1443.	0.006	222.1	370.0	78.15	12.50	21.09	350
19	15432.	1527.	0.005	234.7	391.1	79.29	12.50	21.06	360
20	16264.	1612.	0.005	247.3	412.1	80.37	12.50	21.03	369
21	17095.	1696.	0.005	259.9	433.1	81.40	12.49	21.00	378
22	17924.	1780.	0.005	272.5	454.1	82.37	12.49	20.98	388
23	18753.	1863.	0.004	285.1	475.1	83.31	12.49	20.96	396
24	19581.	1947.	0.004	297.6	496.1	84.20	12.49	20.95	405
25	20408.	2030.	0.004	310.2	517.0	85.05	12.49	20.93	414
26	21235.	2113.	0.004	322.8	537.9	85.87	12.49	20.92	422
27	22061.	2197.	0.004	335.3	558.8	86.66	12.49	20.91	430
28	22887.	2280.	0.004	347.8	579.7	87.42	12.48	20.90	438
29	23712.	2363.	0.003	360.4	600.6	88.16	12.48	20.89	446
30	24537.	2446.	0.003	372.9	621.5	88.86	12.48	20.88	453
31	25362.	2528.	0.003	385.4	642.4	89.55	12.48	20.88	461
32	26186.	2611.	0.003	397.9	663.3	90.21	12.48	20.87	468
33	27010.	2694.	0.003	410.5	684.1	90.85	12.48	20.87	476
34	27834.	2777.	0.003	423.0	705.0	91.48	12.48	20.86	483
35	28658.	2859.	0.003	435.5	725.9	92.08	12.48	20.86	490
36	29481.	2942.	0.003	448.0	746.7	92.67	12.49	20.86	497
37	30304.	3025.	0.003	460.5	767.6	93.24	12.49	20.85	504
38	31128.	3107.	0.003	473.0	788.4	93.80	12.49	20.85	511
39	31951.	3190.	0.003	485.6	809.3	94.34	12.49	20.85	517
40	32773.	3272.	0.003	498.1	830.1	94.87	12.50	20.86	524
41	33596.	3355.	0.002	510.6	851.0	95.38	12.50	20.86	530
42	34419.	3437.	0.002	523.1	871.9	95.88	12.51	20.86	537
43	35241.	3520.	0.002	535.7	892.7	96.37	12.52	20.87	543
44	36064.	3602.	0.002	548.2	913.6	96.85	12.53	20.88	549
45	36886.	3685.	0.002	560.7	934.5	97.32	12.54	20.89	555
46	37708.	3767.	0.002	573.3	955.4	97.78	12.55	20.90	561
47	38530.	3849.	0.002	585.9	976.3	98.23	12.57	20.92	567
48	39352.	3932.	0.002	598.5	997.2	98.67	12.59	20.93	573
49	40174.	4014.	0.002	611.1	1018.2	99.10	12.61	20.95	579
50	40996.	4096.	0.002	623.7	1039.1	99.53	12.64	20.98	585
51	41818.	4179.	0.002	636.4	1060.1	99.94	12.66	21.00	590
52	42640.	4261.	0.002	649.1	1081.2	100.35	12.70	21.03	596
53	43462.	4343.	0.002	661.8	1102.2	100.75	12.73	21.07	601
54	44284.	4426.	0.002	674.6	1123.3	101.15	12.77	21.11	606
55	45105.	4508.	0.002	687.4	1144.4	101.54	12.81	21.15	612
56	45927.	4590.	0.002	700.2	1165.6	101.92	12.86	21.19	617
57	46749.	4672.	0.002	713.1	1186.8	102.29	12.91	21.24	622
58	47570.	4755.	0.002	726.1	1208.1	102.66	12.96	21.30	627
59	48392.	4837.	0.002	739.1	1229.4	103.03	13.02	21.36	631
60	49213.	4919.	0.002	752.1	1250.8	103.39	13.09	21.42	636
61	50035.	5001.	0.002	765.3	1272.2	103.74	13.15	21.49	641
62	50856.	5084.	0.002	778.5	1293.8	104.09	13.23	21.56	645
63	51677.	5166.	0.002	791.7	1315.4	104.44	13.31	21.64	650
64	52499.	5248.	0.002	805.1	1337.0	104.78	13.39	21.72	654
65	53320.	5330.	0.002	818.5	1358.8	105.11	13.47	21.80	658
66	54142.	5412.	0.002	832.1	1380.7	105.45	13.57	21.89	663
67	54963.	5495.	0.001	845.7	1402.6	105.78	13.66	21.99	667
68	55784.	5577.	0.001	859.4	1424.6	106.10	13.76	22.09	671
69	56605.	5659.	0.001	873.2	1446.8	106.43	13.87	22.20	675
70	57427.	5741.	0.001	887.2	1469.0	106.75	13.98	22.31	679
71	58248.	5823.	0.001	901.2	1491.4	107.07	14.09	22.42	682
72	59069.	5905.	0.001	915.4	1513.9	107.38	14.21	22.54	686
73	59890.	5988.	0.001	929.6	1536.5	107.69	14.34	22.66	690
74	60711.	6070.	0.001	944.1	1559.2	108.00	14.46	22.79	693
75	61532.	6152.	0.001	958.6	1582.1	108.31	14.60	22.92	697
76	62354.	6234.	0.001	973.3	1605.1	108.61	14.73	23.06	700
77	63175.	6316.	0.001	988.1	1628.2	108.91	14.87	23.20	704
78	63996.	6399.	0.001	1003.0	1651.5	109.21	15.01	23.34	707
79	64817.	6481.	0.001	1018.1	1674.9	109.51	15.16	23.48	710
80	65638.	6563.	0.001	1033.4	1698.4	109.81	15.31	23.63	714
81	66459.	6645.	0.001	1048.7	1722.1	110.10	15.46	23.79	717
82	67280.	6727.	0.001	1064.3	1746.0	110.40	15.62	23.94	720
83	68101.	6809.	0.001	1080.0	1770.0	110.69	15.78	24.10	723
84	68922.	6891.	0.001	1095.9	1794.2	110.98	15.94	24.26	726
85	69743.	6974.	0.001	1111.9	1818.5	111.27	16.10	24.42	729
86	70564.	7056.	0.001	1128.1	1843.1	111.55	16.27	24.59	732
87	71385.	7138.	0.001	1144.4	1867.7	111.84	16.43	24.76	735
88	72206.	7220.	0.001	1160.9	1892.6	112.12	16.60	24.92	738
89	73027.	7302.	0.001	1177.6	1917.6	112.40	16.77	25.09	741
90	73848.	7384.	0.001	1194.5	1942.8	112.69	16.94	25.27	744
91	74669.	7466.	0.001	1211.5	1968.1	112.97	17.12	25.44	747
92	75490.	7549.	0.001	1228.7	1993.6	113.24	17.29	25.61	750
93	76311.	7631.	0.001	1246.1	2019.3	113.52	17.47	25.79	752
94	77132.	7713.	0.001	1263.7	2045.2	113.80	17.64	25.96	755
95	77953.	7795.	0.001	1281.4	2071.3	114.07	17.82	26.14	758
96	78774.	7877.	0.001	1299.3	2097.5	114.35	17.99	26.31	761
97	79595.	7959.	0.001	1317.4	2123.9	114.62	18.17	26.49	764
98	80415.	8041.	0.001	1335.7	2150.5	114.90	18.34	26.66	766
99	81236.	8123.	0.001	1354.1	2177.2	115.17	18.52	26.84	769
100	82057.	8205.	0.001	1372.7	2204.1	115.44	18.69	27.01	772

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

0.15 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3 ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
• 13.806	26.18	23316.	9.402	-622.9	-622.5	10.00	9.50	13.13	1273
14	26.23	22855.	9.370	-620.3	-619.9	10.19	9.56	13.31	1265
15	26.52	21381.	9.135	-606.6	-606.2	11.14	9.90	14.08	1236
• 15.248	26.60	21020.	9.077	-603.0	-602.6	11.37	9.99	14.28	1229
• 15.248	8119.9	1184.	0.010	185.5	308.9	71.16	12.59	21.59	319
16	8546.3	1251.	0.010	195.2	325.1	72.19	12.56	21.47	328
17	9111.3	1338.	0.009	208.1	346.5	73.49	12.54	21.36	338
18	9673.6	1425.	0.009	220.8	367.9	74.71	12.53	21.27	349
19	10234.	1511.	0.008	233.6	389.1	75.86	12.52	21.21	359
20	10792.	1597.	0.008	246.2	410.3	76.95	12.51	21.16	368
21	11350.	1682.	0.007	258.9	431.4	77.98	12.51	21.12	378
22	11906.	1766.	0.007	271.6	452.5	78.96	12.50	21.08	387
23	12461.	1851.	0.007	284.2	473.6	79.89	12.50	21.05	396
24	13016.	1935.	0.006	296.8	494.6	80.79	12.50	21.03	405
25	13570.	2019.	0.006	309.4	515.6	81.65	12.50	21.01	413
26	14123.	2103.	0.006	322.0	536.6	82.47	12.49	20.99	421
27	14675.	2187.	0.006	334.6	557.6	83.26	12.49	20.97	430
28	15228.	2271.	0.005	347.1	578.6	84.03	12.49	20.96	438
29	15780.	2354.	0.005	359.7	599.5	84.76	12.49	20.94	445
30	16331.	2438.	0.005	372.3	620.5	85.47	12.49	20.93	453
31	16882.	2521.	0.005	384.8	641.4	86.16	12.49	20.92	461
32	17433.	2604.	0.005	397.4	662.3	86.82	12.49	20.91	468
33	17984.	2687.	0.005	409.9	683.2	87.46	12.49	20.90	475
34	18534.	2770.	0.004	422.4	704.1	88.09	12.49	20.90	483
35	19084.	2853.	0.004	435.0	725.0	88.69	12.49	20.89	490
36	19634.	2936.	0.004	447.5	745.9	89.28	12.49	20.89	497
37	20184.	3019.	0.004	460.0	766.8	89.86	12.49	20.88	504
38	20733.	3102.	0.004	472.6	787.7	90.41	12.49	20.88	510
39	21283.	3185.	0.004	485.1	808.6	90.95	12.50	20.88	517
40	21832.	3267.	0.004	497.6	829.4	91.48	12.50	20.88	524
41	22381.	3350.	0.004	510.2	850.3	92.00	12.51	20.88	530
42	22930.	3433.	0.004	522.7	871.2	92.50	12.51	20.89	537
43	23479.	3515.	0.004	535.2	892.1	92.99	12.52	20.89	543
44	24028.	3598.	0.003	547.8	913.0	93.47	12.53	20.90	549
45	24577.	3680.	0.003	560.4	933.9	93.94	12.54	20.91	555
46	25126.	3763.	0.003	572.9	954.8	94.40	12.56	20.92	561
47	25674.	3846.	0.003	585.5	975.7	94.85	12.57	20.93	567
48	26223.	3928.	0.003	598.1	996.7	95.29	12.59	20.95	573
49	26771.	4010.	0.003	610.8	1017.7	95.73	12.61	20.97	579
50	27320.	4093.	0.003	623.4	1038.6	96.15	12.64	20.99	585
51	27868.	4175.	0.003	636.1	1059.6	96.57	12.67	21.02	590
52	28416.	4258.	0.003	648.8	1080.7	96.97	12.70	21.05	596
53	28965.	4340.	0.003	661.5	1101.7	97.38	12.73	21.08	601
54	29513.	4423.	0.003	674.3	1122.8	97.77	12.77	21.12	606
55	30061.	4505.	0.003	687.1	1144.0	98.16	12.81	21.16	611
56	30609.	4587.	0.003	699.9	1165.2	98.54	12.86	21.20	617
57	31157.	4670.	0.003	712.8	1186.4	98.92	12.91	21.25	622
58	31705.	4752.	0.003	725.8	1207.7	99.29	12.96	21.31	627
59	32253.	4834.	0.003	738.8	1229.0	99.65	13.02	21.37	631
60	32801.	4917.	0.003	751.9	1250.4	100.01	13.09	21.43	636
61	33349.	4999.	0.002	765.0	1271.9	100.37	13.16	21.50	641
62	33897.	5081.	0.002	778.2	1293.4	100.72	13.23	21.57	645
63	34445.	5164.	0.002	791.5	1315.0	101.06	13.31	21.64	650
64	34993.	5246.	0.002	804.9	1336.7	101.40	13.39	21.73	654
65	35541.	5328.	0.002	818.3	1358.5	101.74	13.48	21.81	658
66	36088.	5411.	0.002	831.8	1380.3	102.07	13.57	21.90	663
67	36636.	5493.	0.002	845.5	1402.3	102.40	13.66	22.00	667
68	37184.	5575.	0.002	859.2	1424.3	102.73	13.76	22.10	671
69	37732.	5657.	0.002	873.0	1446.5	103.05	13.87	22.20	675
70	38279.	5740.	0.002	886.9	1468.7	103.37	13.98	22.31	679
71	38827.	5822.	0.002	901.0	1491.1	103.69	14.10	22.43	682
72	39375.	5904.	0.002	915.2	1513.6	104.01	14.21	22.55	686
73	39922.	5986.	0.002	929.4	1536.2	104.32	14.34	22.67	690
74	40470.	6069.	0.002	943.8	1558.9	104.63	14.47	22.80	693
75	41018.	6151.	0.002	958.4	1581.8	104.93	14.60	22.93	697
76	41565.	6233.	0.002	973.1	1604.8	105.24	14.73	23.06	700
77	42113.	6315.	0.002	987.9	1627.9	105.54	14.87	23.20	704
78	42660.	6397.	0.002	1002.8	1651.2	105.84	15.01	23.34	707
79	43208.	6480.	0.002	1017.9	1674.6	106.14	15.16	23.49	710
80	43755.	6562.	0.002	1033.2	1698.2	106.44	15.31	23.64	714
81	44303.	6644.	0.002	1048.6	1721.9	106.73	15.46	23.79	717
82	44850.	6726.	0.002	1064.1	1745.8	107.02	15.62	23.95	720
83	45398.	6808.	0.002	1079.8	1769.8	107.31	15.78	24.10	723
84	45945.	6891.	0.002	1095.7	1794.0	107.60	15.94	24.26	726
85	46493.	6973.	0.002	1111.7	1818.3	107.89	16.10	24.43	729
86	47040.	7055.	0.002	1127.9	1842.8	108.18	16.27	24.59	732
87	47588.	7137.	0.002	1144.2	1867.5	108.46	16.43	24.76	735
88	48135.	7219.	0.002	1160.8	1892.4	108.75	16.60	24.93	738
89	48683.	7301.	0.002	1177.5	1917.4	109.03	16.77	25.10	741
90	49230.	7384.	0.002	1194.3	1942.6	109.31	16.94	25.27	744
91	49778.	7466.	0.002	1211.4	1967.9	109.59	17.12	25.44	747
92	50325.	7548.	0.002	1228.6	1993.4	109.87	17.29	25.62	750
93	50872.	7630.	0.002	1246.0	2019.2	110.15	17.47	25.79	753
94	51420.	7712.	0.002	1263.5	2045.0	110.43	17.64	25.97	755
95	51967.	7794.	0.002	1281.3	2071.1	110.70	17.82	26.14	758
96	52515.	7877.	0.002	1299.2	2097.3	110.98	17.99	26.32	761
97	53062.	7959.	0.002	1317.2	2123.7	111.25	18.17	26.49	764
98	53609.	8041.	0.002	1335.5	2150.3	111.52	18.34	26.67	766
99	54157.	8123.	0.002	1353.9	2177.1	111.79	18.52	26.84	769
100	54704.	8205.	0.002	1372.6	2204.0	112.07	18.69	27.01	772

• TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

0.20 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3 ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
• 13.808	26.17	23322.	9.402	-622.9	-622.3	10.00	9.50	13.13	1273
14	26.23	22864.	9.370	-620.3	-619.8	10.19	9.56	13.31	1265
15	26.52	21390.	9.136	-606.6	-606.1	11.13	9.90	14.07	1236
• 15.861	26.80	20155.	8.946	-594.1	-593.5	11.95	10.21	14.79	1211
• 15.861	6294.2	1216.	0.013	191.8	319.4	69.51	12.64	21.81	325
16	6355.4	1228.	0.013	193.7	322.5	69.70	12.63	21.78	326
17	6784.4	1318.	0.012	206.7	344.1	71.02	12.58	21.59	337
18	7210.4	1407.	0.011	219.5	365.7	72.25	12.56	21.46	348
19	7634.3	1494.	0.011	232.4	387.1	73.40	12.54	21.37	358
20	8056.4	1581.	0.010	245.1	408.4	74.50	12.53	21.29	368
21	8477.1	1668.	0.010	257.9	429.7	75.54	12.52	21.23	377
22	8896.7	1753.	0.009	270.6	450.9	76.52	12.51	21.19	386
23	9315.3	1839.	0.009	283.3	472.1	77.46	12.51	21.15	395
24	9733.1	1924.	0.008	295.9	493.2	78.36	12.51	21.11	404
25	10150.	2009.	0.008	308.6	514.3	79.22	12.50	21.08	413
26	10567.	2093.	0.008	321.2	535.3	80.05	12.50	21.06	421
27	10983.	2177.	0.008	333.8	556.4	80.84	12.50	21.03	429
28	11398.	2262.	0.007	346.4	577.4	81.61	12.50	21.01	437
29	11813.	2346.	0.007	359.0	598.4	82.35	12.50	21.00	445
30	12228.	2429.	0.007	371.6	619.4	83.06	12.49	20.98	453
31	12642.	2513.	0.007	384.2	640.4	83.75	12.49	20.97	460
32	13056.	2597.	0.006	396.8	661.4	84.41	12.49	20.96	468
33	13470.	2680.	0.006	409.3	682.3	85.06	12.49	20.94	475
34	13884.	2764.	0.006	421.9	703.2	85.68	12.49	20.93	482
35	14297.	2847.	0.006	434.4	724.2	86.29	12.49	20.93	490
36	14710.	2930.	0.006	447.0	745.1	86.88	12.49	20.92	497
37	15123.	3013.	0.005	459.5	766.0	87.45	12.49	20.91	503
38	15536.	3096.	0.005	472.1	786.9	88.01	12.50	20.91	510
39	15949.	3179.	0.005	484.6	807.8	88.55	12.50	20.91	517
40	16361.	3262.	0.005	497.2	828.7	89.08	12.50	20.91	524
41	16774.	3345.	0.005	509.7	849.7	89.60	12.51	20.91	530
42	17186.	3428.	0.005	522.3	870.6	90.10	12.51	20.91	537
43	17598.	3511.	0.005	534.8	891.5	90.59	12.52	20.91	543
44	18011.	3594.	0.005	547.4	912.4	91.07	12.53	20.92	549
45	18423.	3676.	0.004	560.0	933.3	91.54	12.54	20.93	555
46	18834.	3759.	0.004	572.6	954.2	92.00	12.56	20.94	561
47	19246.	3842.	0.004	585.2	975.2	92.45	12.57	20.95	567
48	19658.	3924.	0.004	597.8	996.2	92.90	12.59	20.97	573
49	20070.	4007.	0.004	610.4	1017.1	93.33	12.62	20.99	579
50	20481.	4089.	0.004	623.1	1038.1	93.75	12.64	21.01	584
51	20893.	4172.	0.004	635.8	1059.1	94.17	12.67	21.03	590
52	21305.	4255.	0.004	648.5	1080.2	94.58	12.70	21.06	596
53	21716.	4337.	0.004	661.2	1101.3	94.98	12.73	21.09	601
54	22128.	4420.	0.004	674.0	1122.4	95.37	12.77	21.13	606
55	22539.	4502.	0.004	686.8	1143.5	95.76	12.81	21.17	611
56	22950.	4585.	0.004	699.7	1164.7	96.14	12.86	21.22	617
57	23362.	4667.	0.004	712.6	1186.0	96.52	12.91	21.26	622
58	23773.	4750.	0.003	725.5	1207.3	96.89	12.97	21.32	627
59	24184.	4832.	0.003	738.5	1228.6	97.25	13.02	21.38	631
60	24595.	4915.	0.003	751.6	1250.0	97.61	13.09	21.44	636
61	25006.	4997.	0.003	764.7	1271.5	97.97	13.16	21.50	641
62	25418.	5079.	0.003	778.0	1293.0	98.32	13.23	21.58	645
63	25829.	5162.	0.003	791.2	1314.7	98.66	13.31	21.65	650
64	26240.	5244.	0.003	804.6	1336.4	99.01	13.39	21.73	654
65	26651.	5326.	0.003	818.1	1358.1	99.34	13.48	21.82	658
66	27062.	5409.	0.003	831.6	1380.0	99.68	13.57	21.91	663
67	27473.	5491.	0.003	845.2	1402.0	100.01	13.66	22.01	667
68	27884.	5573.	0.003	858.9	1424.0	100.34	13.77	22.11	671
69	28295.	5656.	0.003	872.8	1446.2	100.66	13.87	22.21	675
70	28706.	5738.	0.003	886.7	1468.4	100.98	13.98	22.32	679
71	29117.	5820.	0.003	900.8	1490.8	101.30	14.10	22.43	682
72	29527.	5903.	0.003	914.9	1513.3	101.61	14.21	22.55	686
73	29938.	5985.	0.003	929.2	1535.9	101.92	14.34	22.68	690
74	30349.	6067.	0.003	943.6	1558.7	102.23	14.47	22.80	693
75	30760.	6150.	0.003	958.2	1581.5	102.54	14.60	22.93	697
76	31171.	6232.	0.003	972.9	1604.5	102.84	14.73	23.07	700
77	31582.	6314.	0.003	987.7	1627.7	103.15	14.87	23.21	704
78	31993.	6396.	0.003	1002.6	1651.0	103.45	15.02	23.35	707
79	32403.	6479.	0.003	1017.7	1674.4	103.75	15.16	23.49	710
80	32814.	6561.	0.003	1033.0	1697.9	104.04	15.31	23.64	714
81	33225.	6643.	0.002	1048.4	1721.7	104.34	15.46	23.80	717
82	33636.	6725.	0.002	1063.9	1745.5	104.63	15.62	23.95	720
83	34046.	6808.	0.002	1079.6	1769.6	104.92	15.78	24.11	723
84	34457.	6890.	0.002	1095.5	1793.8	105.21	15.94	24.27	726
85	34868.	6972.	0.002	1111.5	1818.1	105.50	16.10	24.43	729
86	35278.	7054.	0.002	1127.7	1842.6	105.79	16.27	24.60	732
87	35689.	7136.	0.002	1144.1	1867.3	106.07	16.43	24.76	735
88	36100.	7219.	0.002	1160.6	1892.2	106.35	16.60	24.93	738
89	36510.	7301.	0.002	1177.3	1917.2	106.64	16.77	25.10	741
90	36921.	7383.	0.002	1194.2	1942.4	106.92	16.95	25.27	744
91	37332.	7465.	0.002	1211.2	1967.7	107.20	17.12	25.45	747
92	37742.	7547.	0.002	1228.4	1993.3	107.48	17.29	25.62	750
93	38153.	7630.	0.002	1245.8	2019.0	107.76	17.47	25.79	753
94	38564.	7712.	0.002	1263.4	2044.9	108.03	17.64	25.97	755
95	38974.	7794.	0.002	1281.1	2070.9	108.31	17.82	26.14	758
96	39385.	7876.	0.002	1299.0	2097.1	108.58	17.99	26.32	761
97	39796.	7958.	0.002	1317.1	2123.6	108.86	18.17	26.49	764
98	40206.	8041.	0.002	1335.4	2150.1	109.13	18.34	26.67	767
99	40617.	8123.	0.002	1353.8	2176.9	109.40	18.52	26.84	769
100	41027.	8205.	0.002	1372.4	2203.8	109.67	18.69	27.02	772

• TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

0.30 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 13.811	26.17	23332.	9.402	-622.9	-622.1	10.00	9.50	13.13	1273
14	26.23	22882.	9.371	-620.3	-619.5	10.19	9.56	13.31	1265
15	26.52	21409.	9.138	-606.6	-605.8	11.13	9.90	14.07	1237
16	26.84	19979.	8.923	-592.1	-591.2	12.07	10.26	14.91	1208
* 16.802	27.11	18605.	8.778	-579.7	-578.9	12.83	10.54	15.73	1181
* 16.802	4397.5	1259.	0.019	201.1	334.7	67.20	12.72	22.22	332
17	4455.4	1277.	0.019	203.7	339.1	67.46	12.70	22.15	335
18	4745.9	1370.	0.018	216.9	361.1	68.72	12.64	21.90	345
19	5033.7	1461.	0.017	229.9	383.0	69.90	12.60	21.72	356
20	5319.5	1550.	0.016	242.9	404.6	71.01	12.57	21.59	366
21	5603.8	1639.	0.015	255.8	426.1	72.06	12.55	21.49	376
22	5886.9	1727.	0.014	268.6	447.6	73.06	12.54	21.41	385
23	6168.9	1814.	0.013	281.4	469.0	74.01	12.53	21.34	394
24	6450.1	1901.	0.013	294.2	490.3	74.92	12.53	21.29	403
25	6730.5	1987.	0.012	306.9	511.5	75.79	12.52	21.24	412
26	7010.3	2073.	0.012	319.7	532.8	76.62	12.52	21.20	420
27	7289.6	2158.	0.011	332.4	553.9	77.42	12.51	21.16	428
28	7568.4	2243.	0.011	345.0	575.1	78.19	12.51	21.13	436
29	7846.7	2328.	0.011	357.7	596.2	78.93	12.51	21.11	444
30	8124.7	2413.	0.010	370.3	617.3	79.64	12.51	21.08	452
31	8402.4	2498.	0.010	383.0	638.4	80.33	12.50	21.06	460
32	8679.7	2582.	0.010	395.6	659.4	81.00	12.50	21.04	467
33	8956.8	2666.	0.009	408.2	680.5	81.65	12.50	21.02	475
34	9233.6	2750.	0.009	420.8	701.5	82.28	12.50	21.01	482
35	9510.3	2834.	0.009	433.4	722.5	82.89	12.50	21.00	489
36	9786.7	2918.	0.008	446.0	743.5	83.48	12.50	20.98	496
37	10063.	3002.	0.008	458.6	764.4	84.05	12.50	20.98	503
38	10339.	3085.	0.008	471.1	785.4	84.61	12.50	20.97	510
39	10615.	3169.	0.008	483.7	806.4	85.16	12.51	20.96	517
40	10891.	3252.	0.008	496.3	827.3	85.69	12.51	20.96	523
41	11166.	3335.	0.007	508.9	848.3	86.20	12.51	20.95	530
42	11442.	3419.	0.007	521.4	869.3	86.71	12.52	20.95	536
43	11717.	3502.	0.007	534.0	890.2	87.20	12.53	20.96	543
44	11993.	3585.	0.007	546.6	911.2	87.68	12.54	20.96	549
45	12268.	3668.	0.007	559.2	932.1	88.15	12.55	20.97	555
46	12543.	3751.	0.007	571.8	953.1	88.62	12.56	20.97	561
47	12818.	3834.	0.006	584.4	974.1	89.07	12.58	20.99	567
48	13093.	3917.	0.006	597.1	995.1	89.51	12.60	21.00	573
49	13368.	4000.	0.006	609.7	1016.1	89.94	12.62	21.02	579
50	13643.	4083.	0.006	622.4	1037.1	90.37	12.64	21.04	584
51	13918.	4166.	0.006	635.1	1058.2	90.78	12.67	21.06	590
52	14193.	4249.	0.006	647.8	1079.2	91.19	12.70	21.09	595
53	14468.	4331.	0.006	660.6	1100.4	91.60	12.74	21.12	601
54	14742.	4414.	0.006	673.4	1121.5	91.99	12.77	21.16	606
55	15017.	4497.	0.005	686.2	1142.7	92.38	12.82	21.20	611
56	15291.	4580.	0.005	699.1	1163.9	92.76	12.86	21.24	616
57	15566.	4662.	0.005	712.0	1185.2	93.14	12.91	21.29	622
58	15840.	4745.	0.005	725.0	1206.5	93.51	12.97	21.34	626
59	16115.	4827.	0.005	738.0	1227.8	93.87	13.03	21.40	631
60	16389.	4910.	0.005	751.1	1249.3	94.23	13.09	21.46	636
61	16664.	4993.	0.005	764.2	1270.8	94.59	13.16	21.52	641
62	16938.	5075.	0.005	777.4	1292.3	94.94	13.23	21.60	645
63	17212.	5158.	0.005	790.7	1313.9	95.29	13.31	21.67	650
64	17487.	5240.	0.005	804.1	1335.7	95.63	13.39	21.75	654
65	17761.	5323.	0.005	817.6	1357.5	95.97	13.48	21.84	658
66	18035.	5405.	0.005	831.1	1379.3	96.30	13.57	21.93	663
67	18309.	5488.	0.004	844.8	1401.3	96.63	13.67	22.02	667
68	18584.	5570.	0.004	858.5	1423.4	96.96	13.77	22.12	671
69	18858.	5653.	0.004	872.3	1445.6	97.28	13.87	22.23	675
70	19132.	5735.	0.004	886.3	1467.8	97.60	13.98	22.33	679
71	19406.	5818.	0.004	900.3	1490.2	97.92	14.10	22.45	682
72	19680.	5900.	0.004	914.5	1512.7	98.23	14.22	22.57	686
73	19954.	5982.	0.004	928.8	1535.4	98.55	14.34	22.69	690
74	20229.	6065.	0.004	943.2	1558.1	98.86	14.47	22.81	693
75	20503.	6147.	0.004	957.8	1581.0	99.16	14.60	22.95	697
76	20777.	6229.	0.004	972.5	1604.0	99.47	14.73	23.08	700
77	21051.	6312.	0.004	987.3	1627.2	99.77	14.87	23.22	704
78	21325.	6394.	0.004	1002.2	1650.5	100.07	15.02	23.36	707
79	21599.	6477.	0.004	1017.3	1673.9	100.37	15.16	23.51	710
80	21873.	6559.	0.004	1032.6	1697.5	100.67	15.31	23.65	714
81	22147.	6641.	0.004	1048.0	1721.2	100.96	15.46	23.81	717
82	22421.	6724.	0.004	1063.6	1745.1	101.25	15.62	23.96	720
83	22695.	6806.	0.004	1079.3	1769.1	101.54	15.78	24.12	723
84	22969.	6888.	0.004	1095.1	1793.3	101.83	15.94	24.28	726
85	23243.	6971.	0.004	1111.2	1817.7	102.12	16.10	24.44	729
86	23517.	7053.	0.003	1127.4	1842.2	102.41	16.27	24.61	732
87	23790.	7135.	0.003	1143.7	1866.9	102.70	16.43	24.77	735
88	24064.	7217.	0.003	1160.3	1891.8	102.98	16.60	24.94	738
89	24338.	7300.	0.003	1177.0	1916.8	103.26	16.77	25.11	741
90	24612.	7382.	0.003	1193.8	1942.0	103.54	16.95	25.28	744
91	24886.	7464.	0.003	1210.9	1967.4	103.82	17.12	25.45	747
92	25160.	7547.	0.003	1228.1	1992.9	104.10	17.29	25.63	750
93	25434.	7629.	0.003	1245.5	2018.6	104.38	17.47	25.80	753
94	25708.	7711.	0.003	1263.0	2044.5	104.66	17.64	25.98	755
95	25982.	7793.	0.003	1280.8	2070.6	104.93	17.82	26.15	758
96	26255.	7874.	0.003	1298.7	2096.8	105.21	17.99	26.33	761
97	26529.	7958.	0.003	1316.8	2123.2	105.48	18.17	26.50	764
98	26803.	8040.	0.003	1335.1	2149.8	105.76	18.34	26.68	767
99	27077.	8122.	0.003	1353.5	2176.6	106.03	18.52	26.85	769
100	27351.	8204.	0.003	1372.1	2203.5	106.30	18.69	27.02	772

* TWO-PHASE BOUNDARY

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TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

0.40 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 13.814	26.17	23343.	9.403	-622.8	-621.8	10.01	9.50	13.13	1273
14	26.22	22900.	9.372	-620.4	-619.3	10.18	9.56	13.31	1265
15	26.51	21428.	9.141	-606.7	-605.6	11.13	9.90	14.07	1237
16	26.83	19998.	8.926	-592.1	-591.0	12.07	10.26	14.91	1209
17	27.18	18347.	8.749	-576.6	-575.5	13.01	10.61	15.92	1176
* 17.532	27.37	17563.	8.663	-568.0	-566.9	13.51	10.79	16.48	1161
* 17.532	3407.8	1287.	0.025	207.8	345.9	65.58	12.79	22.59	338
18	3512.0	1332.	0.024	214.1	356.4	66.17	12.74	22.41	343
19	3732.3	1426.	0.022	227.4	378.7	67.37	12.67	22.12	354
20	3950.2	1519.	0.021	240.6	400.7	68.50	12.62	21.91	364
21	4166.5	1610.	0.020	253.7	422.5	69.57	12.59	21.76	374
22	4381.5	1700.	0.019	266.6	444.2	70.58	12.57	21.64	383
23	4595.3	1789.	0.018	279.6	465.8	71.54	12.56	21.55	393
24	4808.3	1877.	0.017	292.4	487.3	72.45	12.55	21.47	402
25	5020.4	1965.	0.017	305.3	508.8	73.33	12.54	21.40	411
26	5231.9	2052.	0.016	318.1	530.1	74.17	12.53	21.34	419
27	5442.9	2139.	0.015	330.9	551.5	74.97	12.53	21.30	427
28	5653.3	2225.	0.015	343.6	572.7	75.74	12.52	21.25	436
29	5863.4	2311.	0.014	356.3	594.0	76.49	12.52	21.22	444
30	6073.0	2397.	0.014	369.0	615.2	77.21	12.52	21.18	452
31	6282.3	2482.	0.013	381.7	636.3	77.90	12.51	21.15	459
32	6491.3	2567.	0.013	394.4	657.5	78.57	12.51	21.13	467
33	6700.0	2652.	0.012	407.0	678.6	79.22	12.51	21.11	474
34	6908.5	2737.	0.012	419.7	699.7	79.85	12.51	21.08	482
35	7116.8	2821.	0.012	432.3	720.8	80.46	12.51	21.07	489
36	7324.8	2906.	0.011	445.0	741.8	81.06	12.51	21.05	496
37	7532.7	2990.	0.011	457.6	762.9	81.63	12.51	21.04	503
38	7740.4	3074.	0.011	470.2	783.9	82.19	12.51	21.03	510
39	7948.0	3158.	0.010	482.8	804.9	82.74	12.51	21.02	516
40	8155.4	3242.	0.010	495.4	825.9	83.27	12.51	21.01	523
41	8362.7	3326.	0.010	508.0	846.9	83.79	12.52	21.00	530
42	8569.9	3409.	0.010	520.6	867.9	84.30	12.52	21.00	536
43	8776.9	3493.	0.009	533.2	888.9	84.79	12.53	21.00	542
44	8983.9	3577.	0.009	545.8	909.9	85.27	12.54	21.00	549
45	9190.8	3660.	0.009	558.4	931.0	85.75	12.55	21.00	555
46	9397.6	3743.	0.009	571.1	952.0	86.21	12.57	21.01	561
47	9604.3	3827.	0.009	583.7	973.0	86.66	12.58	21.02	567
48	9810.9	3910.	0.008	596.4	994.0	87.10	12.60	21.03	573
49	10018.	3993.	0.008	609.0	1015.0	87.54	12.62	21.05	579
50	10224.	4076.	0.008	621.7	1036.1	87.96	12.65	21.07	584
51	10430.	4159.	0.008	634.4	1057.2	88.38	12.67	21.09	590
52	10637.	4242.	0.008	647.2	1078.3	88.79	12.70	21.12	595
53	10843.	4325.	0.008	660.0	1099.4	89.19	12.74	21.15	601
54	11049.	4408.	0.007	672.8	1120.6	89.59	12.78	21.18	606
55	11256.	4491.	0.007	685.6	1141.8	89.98	12.82	21.22	611
56	11462.	4574.	0.007	698.5	1163.0	90.36	12.87	21.26	616
57	11668.	4657.	0.007	711.4	1184.3	90.74	12.92	21.31	621
58	11874.	4740.	0.007	724.4	1205.7	91.11	12.97	21.36	626
59	12080.	4823.	0.007	737.4	1227.0	91.47	13.03	21.42	631
60	12286.	4906.	0.007	750.5	1248.5	91.83	13.09	21.48	636
61	12492.	4988.	0.007	763.7	1270.0	92.19	13.16	21.54	641
62	12698.	5071.	0.006	776.9	1291.6	92.54	13.23	21.61	645
63	12904.	5154.	0.006	790.2	1313.2	92.89	13.31	21.69	650
64	13110.	5236.	0.006	803.6	1335.0	93.23	13.39	21.77	654
65	13316.	5319.	0.006	817.1	1356.8	93.57	13.48	21.85	658
66	13522.	5402.	0.006	830.6	1378.7	93.90	13.57	21.94	663
67	13728.	5484.	0.006	844.3	1400.7	94.23	13.67	22.04	667
68	13934.	5567.	0.006	858.0	1422.8	94.56	13.77	22.14	671
69	14139.	5649.	0.006	871.9	1444.9	94.88	13.87	22.24	675
70	14345.	5732.	0.006	885.8	1467.2	95.20	13.98	22.35	679
71	14551.	5815.	0.006	899.9	1489.7	95.52	14.10	22.46	682
72	14757.	5897.	0.006	914.1	1512.2	95.84	14.22	22.58	686
73	14962.	5980.	0.005	928.4	1534.8	96.15	14.34	22.70	690
74	15168.	6062.	0.005	942.8	1557.6	96.46	14.47	22.83	693
75	15374.	6145.	0.005	957.4	1580.5	96.77	14.60	22.96	697
76	15580.	6227.	0.005	972.1	1603.5	97.07	14.74	23.09	700
77	15785.	6310.	0.005	986.9	1626.7	97.37	14.87	23.23	704
78	15991.	6392.	0.005	1001.8	1650.0	97.67	15.02	23.37	707
79	16197.	6475.	0.005	1017.0	1673.4	97.97	15.16	23.52	710
80	16402.	6557.	0.005	1032.2	1697.0	98.27	15.31	23.66	714
81	16608.	6639.	0.005	1047.6	1720.7	98.56	15.47	23.82	717
82	16813.	6722.	0.005	1063.2	1744.6	98.86	15.62	23.97	720
83	17019.	6804.	0.005	1078.9	1768.7	99.15	15.78	24.13	723
84	17225.	6887.	0.005	1094.8	1792.9	99.44	15.94	24.29	726
85	17430.	6969.	0.005	1110.8	1817.3	99.73	16.10	24.45	729
86	17636.	7051.	0.005	1127.0	1841.8	100.01	16.27	24.61	732
87	17841.	7134.	0.005	1143.4	1866.5	100.30	16.44	24.78	735
88	18047.	7216.	0.005	1159.9	1891.4	100.58	16.60	24.95	738
89	18252.	7298.	0.005	1176.6	1916.4	100.87	16.77	25.12	741
90	18458.	7381.	0.004	1193.5	1941.6	101.15	16.95	25.29	744
91	18663.	7463.	0.004	1210.6	1967.0	101.43	17.12	25.46	747
92	18869.	7546.	0.004	1227.8	1992.5	101.71	17.29	25.63	750
93	19074.	7628.	0.004	1245.2	2018.2	101.99	17.47	25.81	753
94	19280.	7710.	0.004	1262.7	2044.1	102.26	17.64	25.98	755
95	19485.	7792.	0.004	1280.5	2070.2	102.54	17.82	26.16	758
96	19691.	7875.	0.004	1298.4	2096.5	102.81	17.99	26.33	761
97	19896.	7957.	0.004	1316.5	2122.9	103.09	18.17	26.51	764
98	20102.	8039.	0.004	1334.8	2149.5	103.36	18.34	26.68	767
99	20307.	8122.	0.004	1353.2	2176.2	103.63	18.52	26.86	769
100	20512.	8204.	0.004	1371.8	2203.2	103.90	18.69	27.03	772

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

0.50 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
• 13.818	26.17	23353.	9.403	-622.8	-621.5	10.01	9.50	13.13	1274
14	26.22	22918.	9.373	-620.4	-619.1	10.18	9.56	13.30	1266
15	26.51	21447.	9.143	-606.7	-605.4	11.12	9.90	14.07	1237
16	26.83	20017.	8.928	-592.2	-590.8	12.07	10.26	14.91	1209
17	27.17	18628.	8.751	-576.7	-575.3	13.01	10.61	15.92	1177
18	27.54	16916.	8.589	-560.3	-558.9	13.95	10.94	16.98	1148
• 18.137	27.59	16845.	8.567	-557.9	-556.5	14.07	10.99	17.08	1147
• 18.137	2795.4	1306.	0.030	213.0	354.6	64.32	12.86	22.94	342
19	2950.4	1391.	0.029	224.8	374.3	65.37	12.76	22.58	352
20	3128.0	1487.	0.027	238.2	396.7	66.52	12.68	22.28	362
21	3303.6	1580.	0.025	251.5	418.8	67.61	12.64	22.06	372
22	3477.8	1673.	0.024	264.6	440.8	68.63	12.61	21.89	382
23	3650.8	1764.	0.023	277.7	462.6	69.60	12.59	21.76	391
24	3822.9	1854.	0.022	290.7	484.3	70.52	12.57	21.66	401
25	3994.2	1943.	0.021	303.6	506.0	71.40	12.56	21.57	410
26	4164.7	2031.	0.020	316.5	527.5	72.25	12.55	21.50	418
27	4334.7	2119.	0.019	329.3	549.0	73.06	12.54	21.43	427
28	4504.2	2207.	0.018	342.2	570.4	73.84	12.54	21.38	435
29	4673.2	2294.	0.018	355.0	591.7	74.59	12.53	21.33	443
30	4841.9	2380.	0.017	367.7	613.0	75.31	12.53	21.29	451
31	5010.2	2467.	0.017	380.5	634.3	76.01	12.53	21.25	459
32	5178.2	2552.	0.016	393.2	655.5	76.68	12.52	21.22	466
33	5345.9	2638.	0.015	405.9	676.7	77.33	12.52	21.19	474
34	5513.4	2723.	0.015	418.6	697.9	77.96	12.52	21.16	481
35	5680.6	2809.	0.015	431.3	719.1	78.58	12.52	21.14	488
36	5847.7	2894.	0.014	443.9	740.2	79.17	12.51	21.12	495
37	6014.5	2978.	0.014	456.6	761.3	79.75	12.51	21.10	502
38	6181.2	3063.	0.013	469.2	782.4	80.31	12.52	21.08	509
39	6347.8	3148.	0.013	481.9	803.5	80.86	12.52	21.07	516
40	6514.2	3232.	0.013	494.5	824.5	81.39	12.52	21.06	523
41	6680.4	3316.	0.012	507.1	845.6	81.91	12.52	21.05	529
42	6846.6	3400.	0.012	519.8	866.6	82.42	12.53	21.05	536
43	7012.6	3484.	0.012	532.4	887.7	82.92	12.54	21.04	542
44	7178.6	3568.	0.011	545.0	908.7	83.40	12.55	21.04	548
45	7344.4	3652.	0.011	557.7	929.8	83.87	12.56	21.04	555
46	7510.2	3736.	0.011	570.3	950.8	84.34	12.57	21.05	561
47	7675.9	3819.	0.011	583.0	971.9	84.79	12.59	21.06	567
48	7841.5	3903.	0.011	595.7	992.9	85.23	12.60	21.07	573
49	8007.0	3986.	0.010	608.3	1014.0	85.67	12.63	21.08	578
50	8172.5	4070.	0.010	621.1	1035.1	86.09	12.65	21.10	584
51	8337.9	4153.	0.010	633.8	1056.2	86.51	12.68	21.12	590
52	8503.3	4236.	0.010	646.5	1077.3	86.92	12.71	21.15	595
53	8668.6	4320.	0.010	659.3	1098.5	87.32	12.74	21.17	601
54	8833.9	4403.	0.009	672.1	1119.7	87.72	12.78	21.21	606
55	8999.1	4486.	0.009	685.0	1140.9	88.11	12.82	21.24	611
56	9164.3	4569.	0.009	697.9	1162.2	88.49	12.87	21.29	616
57	9329.4	4652.	0.009	710.8	1183.5	88.87	12.92	21.33	621
58	9494.5	4735.	0.009	723.8	1204.9	89.24	12.97	21.38	626
59	9659.5	4818.	0.009	736.9	1226.3	89.61	13.03	21.44	631
60	9824.6	4901.	0.008	750.0	1247.7	89.97	13.09	21.50	636
61	9989.5	4984.	0.008	763.2	1269.3	90.32	13.16	21.56	641
62	10154.	5067.	0.008	776.4	1290.9	90.68	13.23	21.63	645
63	10319.	5150.	0.008	789.7	1312.5	91.02	13.31	21.71	650
64	10484.	5233.	0.008	803.1	1334.3	91.36	13.39	21.79	654
65	10649.	5315.	0.008	816.6	1356.1	91.70	13.48	21.87	658
66	10814.	5398.	0.008	830.2	1378.0	92.04	13.57	21.96	663
67	10979.	5481.	0.007	843.8	1400.0	92.37	13.67	22.05	667
68	11144.	5564.	0.007	857.6	1422.1	92.70	13.77	22.15	671
69	11308.	5646.	0.007	871.4	1444.3	93.02	13.87	22.25	675
70	11473.	5729.	0.007	885.4	1466.6	93.34	13.99	22.36	679
71	11638.	5812.	0.007	899.5	1489.1	93.66	14.10	22.48	682
72	11803.	5894.	0.007	913.7	1511.6	93.97	14.22	22.59	686
73	11967.	5977.	0.007	928.0	1534.3	94.29	14.34	22.71	690
74	12132.	6060.	0.007	942.4	1557.0	94.60	14.47	22.84	693
75	12297.	6142.	0.007	957.0	1579.9	94.90	14.60	22.97	697
76	12461.	6225.	0.007	971.7	1603.0	95.21	14.74	23.10	700
77	12626.	6307.	0.007	986.5	1626.1	95.51	14.88	23.24	704
78	12791.	6390.	0.006	1001.5	1649.5	95.81	15.02	23.38	707
79	12955.	6472.	0.006	1016.6	1672.9	96.11	15.16	23.53	710
80	13120.	6555.	0.006	1031.8	1696.5	96.41	15.31	23.67	714
81	13284.	6638.	0.006	1047.3	1720.3	96.70	15.47	23.83	717
82	13449.	6720.	0.006	1062.8	1744.2	97.00	15.62	23.98	720
83	13613.	6803.	0.006	1078.5	1768.2	97.29	15.78	24.14	723
84	13778.	6885.	0.006	1094.4	1792.5	97.58	15.94	24.30	726
85	13943.	6967.	0.006	1110.5	1816.8	97.87	16.10	24.46	729
86	14107.	7050.	0.006	1126.7	1841.4	98.15	16.27	24.62	732
87	14272.	7132.	0.006	1143.0	1866.1	98.44	16.44	24.79	735
88	14436.	7215.	0.006	1159.6	1891.0	98.72	16.60	24.96	738
89	14601.	7297.	0.006	1176.3	1916.0	99.01	16.78	25.13	741
90	14765.	7380.	0.006	1193.2	1941.2	99.29	16.95	25.30	744
91	14930.	7462.	0.006	1210.2	1966.6	99.57	17.12	25.47	747
92	15094.	7545.	0.005	1227.5	1992.2	99.85	17.29	25.64	750
93	15258.	7627.	0.005	1244.9	2017.9	100.13	17.47	25.82	753
94	15423.	7709.	0.005	1262.4	2043.8	100.40	17.64	25.99	756
95	15587.	7791.	0.005	1280.2	2069.9	100.68	17.82	26.17	758
96	15752.	7874.	0.005	1298.1	2096.1	100.96	17.99	26.34	761
97	15916.	7956.	0.005	1316.2	2122.5	101.23	18.17	26.51	764
98	16081.	8039.	0.005	1334.5	2149.1	101.50	18.34	26.69	767
99	16245.	8121.	0.005	1352.9	2175.9	101.77	18.52	26.86	769
100	16409.	8204.	0.005	1371.5	2202.9	102.04	18.69	27.04	772

• TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

0.60 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 13.821	26.17	23364.	9.403	-622.8	-621.2	10.01	9.51	13.14	1274
14	26.22	22939.	9.374	-620.4	-618.9	10.18	9.56	13.30	1266
15	26.51	21468.	9.146	-606.8	-605.2	11.12	9.90	14.07	1238
16	26.83	20035.	8.931	-592.2	-590.6	12.06	10.26	14.90	1209
17	27.17	18639.	8.754	-576.8	-575.1	13.00	10.61	15.91	1177
18	27.54	16938.	8.592	-560.3	-558.7	13.94	10.94	16.97	1149
* 18.659	27.80	16117.	8.482	-548.9	-547.3	14.56	11.15	17.67	1133
* 18.659	2376.6	1319.	0.036	217.3	361.8	63.29	12.92	23.27	346
19	2428.3	1354.	0.035	222.0	369.7	63.71	12.87	23.09	349
20	2579.2	1453.	0.033	235.7	392.5	64.88	12.76	22.67	360
21	2727.9	1550.	0.031	249.2	415.1	65.98	12.69	22.38	371
22	2875.0	1645.	0.029	262.5	437.3	67.01	12.65	22.16	381
23	3020.9	1738.	0.028	275.7	459.4	68.00	12.62	21.99	390
24	3165.8	1830.	0.026	288.9	481.3	68.93	12.60	21.86	399
25	3309.8	1921.	0.025	301.9	503.1	69.82	12.58	21.74	408
26	3453.1	2010.	0.024	314.9	524.8	70.67	12.57	21.65	417
27	3595.8	2100.	0.023	327.8	546.4	71.49	12.56	21.57	426
28	3738.0	2188.	0.022	340.7	568.0	72.27	12.55	21.51	434
29	3879.8	2276.	0.021	353.6	589.4	73.02	12.55	21.45	442
30	4021.1	2364.	0.021	366.4	610.9	73.75	12.54	21.39	450
31	4162.1	2451.	0.020	379.2	632.2	74.45	12.54	21.35	458
32	4302.7	2538.	0.019	392.0	653.6	75.13	12.53	21.31	466
33	4443.1	2624.	0.019	404.7	674.9	75.78	12.53	21.27	473
34	4583.3	2710.	0.018	417.5	696.1	76.42	12.53	21.24	481
35	4723.2	2796.	0.018	430.2	717.3	77.03	12.52	21.21	488
36	4862.9	2881.	0.017	442.9	738.5	77.63	12.52	21.18	495
37	5002.4	2967.	0.017	455.6	759.7	78.21	12.52	21.16	502
38	5141.7	3052.	0.016	468.3	780.9	78.77	12.52	21.14	509
39	5280.9	3137.	0.016	480.9	802.0	79.32	12.52	21.13	516
40	5420.0	3222.	0.015	493.6	823.1	79.86	12.53	21.11	522
41	5558.9	3306.	0.015	506.3	844.2	80.38	12.53	21.10	529
42	5697.7	3391.	0.014	518.9	865.3	80.89	12.53	21.09	536
43	5836.4	3475.	0.014	531.6	886.4	81.38	12.54	21.09	542
44	5975.0	3559.	0.014	544.2	907.5	81.87	12.55	21.08	548
45	6113.5	3644.	0.013	556.9	928.6	82.34	12.56	21.08	554
46	6251.9	3728.	0.013	569.6	949.7	82.80	12.57	21.09	561
47	6390.3	3812.	0.013	582.3	970.8	83.26	12.59	21.09	567
48	6528.5	3895.	0.013	594.9	991.9	83.70	12.61	21.10	572
49	6666.7	3979.	0.012	607.7	1013.0	84.14	12.63	21.11	578
50	6804.9	4063.	0.012	620.4	1034.1	84.56	12.65	21.13	584
51	6942.9	4147.	0.012	633.1	1055.2	84.98	12.68	21.15	590
52	7080.9	4230.	0.012	645.9	1076.4	85.39	12.71	21.17	595
53	7218.9	4314.	0.011	658.7	1097.6	85.80	12.74	21.20	601
54	7356.8	4397.	0.011	671.5	1118.8	86.19	12.78	21.23	606
55	7494.7	4480.	0.011	684.4	1140.0	86.58	12.82	21.27	611
56	7632.5	4564.	0.011	697.3	1161.3	86.97	12.87	21.31	616
57	7770.3	4647.	0.011	710.3	1182.7	87.34	12.92	21.35	621
58	7908.0	4730.	0.010	723.3	1204.0	87.72	12.97	21.40	626
59	8045.7	4813.	0.010	736.3	1225.5	88.08	13.03	21.46	631
60	8183.4	4897.	0.010	749.5	1247.0	88.44	13.10	21.52	636
61	8321.0	4980.	0.010	762.6	1268.5	88.80	13.16	21.58	641
62	8458.6	5063.	0.010	775.9	1290.1	89.15	13.24	21.65	645
63	8596.2	5146.	0.010	789.2	1311.8	89.50	13.31	21.72	650
64	8733.7	5229.	0.009	802.6	1333.6	89.84	13.40	21.80	654
65	8871.2	5312.	0.009	816.1	1355.4	90.18	13.48	21.89	658
66	9008.7	5395.	0.009	829.7	1377.4	90.51	13.57	21.97	663
67	9146.2	5477.	0.009	843.3	1399.4	90.85	13.67	22.07	667
68	9283.6	5560.	0.009	857.1	1421.5	91.17	13.77	22.17	671
69	9421.1	5643.	0.009	871.0	1443.7	91.50	13.88	22.27	675
70	9558.5	5726.	0.009	884.9	1466.0	91.82	13.99	22.38	679
71	9695.8	5809.	0.008	899.0	1488.5	92.14	14.10	22.49	682
72	9833.2	5892.	0.008	913.2	1511.0	92.45	14.22	22.61	686
73	9970.6	5974.	0.008	927.5	1533.7	92.77	14.34	22.73	690
74	10108.	6057.	0.008	942.0	1556.5	93.08	14.47	22.85	693
75	10245.	6140.	0.008	956.6	1579.4	93.38	14.60	22.98	697
76	10382.	6222.	0.008	971.3	1602.5	93.69	14.74	23.11	700
77	10520.	6305.	0.008	986.1	1625.6	93.99	14.88	23.25	704
78	10657.	6388.	0.008	1001.1	1649.0	94.29	15.02	23.39	707
79	10794.	6470.	0.008	1016.2	1672.4	94.59	15.17	23.54	710
80	10932.	6553.	0.008	1031.5	1696.0	94.89	15.31	23.69	714
81	11069.	6636.	0.007	1046.9	1719.8	95.18	15.47	23.84	717
82	11206.	6718.	0.007	1062.5	1743.7	95.48	15.62	23.99	720
83	11343.	6801.	0.007	1078.2	1767.8	95.77	15.78	24.15	723
84	11480.	6883.	0.007	1094.1	1792.0	96.06	15.94	24.31	726
85	11618.	6966.	0.007	1110.1	1816.4	96.35	16.10	24.47	729
86	11755.	7049.	0.007	1126.3	1841.0	96.63	16.27	24.63	732
87	11892.	7131.	0.007	1142.7	1865.7	96.92	16.44	24.80	735
88	12029.	7214.	0.007	1159.2	1890.6	97.20	16.61	24.97	738
89	12166.	7296.	0.007	1176.0	1915.6	97.49	16.78	25.13	741
90	12303.	7379.	0.007	1192.8	1940.8	97.77	16.95	25.31	744
91	12440.	7461.	0.007	1209.9	1966.2	98.05	17.12	25.48	747
92	12578.	7544.	0.007	1227.1	1991.8	98.33	17.29	25.65	750
93	12715.	7626.	0.006	1244.5	2017.5	98.61	17.47	25.82	753
94	12852.	7708.	0.006	1262.1	2043.4	98.88	17.64	26.00	756
95	12989.	7791.	0.006	1279.9	2069.5	99.16	17.82	26.17	758
96	13126.	7873.	0.006	1297.8	2095.8	99.44	17.99	26.35	761
97	13263.	7956.	0.006	1315.9	2122.2	99.71	18.17	26.52	764
98	13400.	8038.	0.006	1334.2	2148.8	99.98	18.35	26.70	767
99	13537.	8121.	0.006	1352.6	2175.6	100.25	18.52	26.87	770
100	13674.	8203.	0.006	1371.2	2202.6	100.53	18.69	27.04	772

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

0.70 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME $CM^3/GMOLE$	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
• 13.825	26.16	23374.	9.404	-622.8	-621.0	10.01	9.51	13.14	1274
14	26.22	22953.	9.375	-620.5	-618.6	10.18	9.56	13.30	1266
15	26.51	21485.	9.149	-606.8	-604.9	11.12	9.90	14.06	1238
16	26.82	20056.	8.934	-592.3	-590.4	12.06	10.26	14.90	1210
17	27.16	18610.	8.757	-576.8	-574.9	13.00	10.61	15.91	1178
18	27.53	16961.	8.595	-560.4	-558.4	13.94	10.94	16.96	1150
19	27.93	15668.	8.424	-542.9	-541.0	14.88	11.24	18.05	1124
• 19.121	27.98	15566.	8.402	-540.8	-538.8	15.00	11.28	18.16	1122
• 19.121	2071.0	1329.	0.041	220.9	367.8	62.42	12.97	23.60	348
20	2186.6	1419.	0.039	233.2	388.3	63.46	12.84	23.12	358
21	2316.2	1519.	0.036	246.9	411.2	64.58	12.75	22.73	369
22	2444.1	1617.	0.034	260.4	433.8	65.63	12.69	22.45	379
23	2570.7	1717.	0.033	273.8	456.1	66.63	12.65	22.23	389
24	2696.2	1806.	0.031	287.0	478.3	67.57	12.62	22.06	398
25	2820.8	1898.	0.030	300.2	500.2	68.47	12.60	21.93	407
26	2944.7	1989.	0.028	313.3	522.1	69.32	12.59	21.81	416
27	3067.9	2080.	0.027	326.3	543.9	70.15	12.58	21.72	425
28	3190.6	2170.	0.026	339.3	565.6	70.93	12.57	21.64	433
29	3312.9	2259.	0.025	352.2	587.2	71.69	12.56	21.57	441
30	3434.7	2347.	0.024	365.1	608.7	72.42	12.55	21.50	450
31	3556.2	2435.	0.023	377.9	630.2	73.13	12.55	21.45	457
32	3677.4	2523.	0.023	390.8	651.6	73.81	12.54	21.40	465
33	3798.2	2610.	0.022	403.6	673.0	74.46	12.54	21.36	473
34	3918.9	2697.	0.021	416.4	694.3	75.10	12.53	21.32	480
35	4039.2	2783.	0.021	429.1	715.6	75.72	12.53	21.28	487
36	4159.4	2869.	0.020	441.9	736.9	76.32	12.53	21.25	495
37	4279.4	2955.	0.019	454.6	758.1	76.90	12.53	21.23	502
38	4399.2	3041.	0.019	467.3	779.3	77.47	12.53	21.20	509
39	4518.9	3126.	0.018	480.0	800.5	78.02	12.53	21.18	515
40	4638.4	3212.	0.018	492.7	821.7	78.55	12.53	21.16	522
41	4757.8	3297.	0.017	505.4	842.9	79.07	12.53	21.15	529
42	4877.1	3382.	0.017	518.1	864.0	79.58	12.54	21.14	535
43	4996.3	3466.	0.017	530.8	885.1	80.08	12.55	21.13	542
44	5115.3	3551.	0.016	543.5	906.3	80.57	12.56	21.12	548
45	5234.3	3635.	0.016	556.1	927.4	81.04	12.57	21.12	554
46	5353.2	3720.	0.015	568.8	948.5	81.51	12.58	21.12	560
47	5472.0	3804.	0.015	581.5	969.6	81.96	12.59	21.13	566
48	5590.7	3888.	0.015	594.2	990.8	82.41	12.61	21.13	572
49	5709.4	3972.	0.014	607.0	1011.9	82.84	12.63	21.15	578
50	5828.0	4056.	0.014	619.7	1033.1	83.27	12.66	21.16	584
51	5946.5	4140.	0.014	632.5	1054.2	83.69	12.68	21.18	589
52	6065.0	4224.	0.014	645.3	1075.4	84.10	12.71	21.20	595
53	6183.4	4308.	0.013	658.1	1096.6	84.50	12.75	21.23	600
54	6301.8	4391.	0.013	670.9	1117.9	84.90	12.78	21.26	606
55	6420.1	4475.	0.013	683.8	1139.2	85.29	12.83	21.29	611
56	6538.4	4558.	0.013	696.7	1160.5	85.67	12.87	21.33	616
57	6656.6	4642.	0.012	709.7	1181.8	86.05	12.92	21.38	621
58	6774.8	4725.	0.012	722.7	1203.2	86.42	12.98	21.43	626
59	6893.0	4809.	0.012	735.8	1224.7	86.79	13.03	21.48	631
60	7011.1	4892.	0.012	748.9	1246.2	87.15	13.10	21.54	636
61	7129.2	4975.	0.012	762.1	1267.8	87.51	13.17	21.60	641
62	7247.3	5059.	0.011	775.4	1289.4	87.86	13.24	21.67	645
63	7365.3	5142.	0.011	788.7	1311.1	88.21	13.32	21.74	650
64	7483.3	5225.	0.011	802.1	1332.9	88.55	13.40	21.82	654
65	7601.3	5308.	0.011	815.6	1354.8	88.89	13.48	21.90	658
66	7719.2	5391.	0.011	829.2	1376.7	89.23	13.58	21.99	663
67	7837.2	5474.	0.011	842.9	1398.7	89.56	13.67	22.08	667
68	7955.1	5557.	0.010	856.6	1420.9	89.89	13.77	22.18	671
69	8072.9	5640.	0.010	870.5	1443.1	90.21	13.88	22.28	675
70	8190.8	5723.	0.010	884.5	1465.5	90.53	13.99	22.39	679
71	8308.7	5806.	0.010	898.6	1487.9	90.85	14.10	22.50	682
72	8426.5	5889.	0.010	912.8	1510.5	91.17	14.22	22.62	686
73	8544.3	5972.	0.010	927.1	1533.1	91.48	14.34	22.74	690
74	8662.1	6055.	0.010	941.6	1555.9	91.79	14.47	22.86	693
75	8779.8	6137.	0.009	956.1	1578.9	92.10	14.60	22.99	697
76	8897.6	6220.	0.009	970.9	1601.9	92.40	14.74	23.13	700
77	9015.3	6303.	0.009	985.7	1625.1	92.70	14.88	23.26	704
78	9133.1	6386.	0.009	1000.7	1648.5	93.01	15.02	23.40	707
79	9250.8	6468.	0.009	1015.8	1671.9	93.30	15.17	23.55	710
80	9368.5	6551.	0.009	1031.1	1695.6	93.60	15.32	23.70	714
81	9486.2	6634.	0.009	1046.5	1719.3	93.90	15.47	23.85	717
82	9603.9	6717.	0.009	1062.1	1743.3	94.19	15.62	24.00	720
83	9721.5	6799.	0.008	1077.8	1767.3	94.48	15.78	24.16	723
84	9839.2	6882.	0.008	1093.7	1791.6	94.77	15.94	24.32	726
85	9956.8	6965.	0.008	1109.8	1816.0	95.06	16.11	24.48	729
86	10074.	7047.	0.008	1126.0	1840.5	95.35	16.27	24.64	732
87	10192.	7130.	0.008	1142.4	1865.3	95.63	16.44	24.81	735
88	10310.	7212.	0.008	1158.9	1890.1	95.92	16.61	24.97	738
89	10427.	7295.	0.008	1175.6	1915.2	96.20	16.78	25.14	741
90	10545.	7377.	0.008	1192.5	1940.4	96.48	16.95	25.31	744
91	10662.	7460.	0.008	1209.6	1965.8	96.76	17.12	25.49	747
92	10780.	7543.	0.008	1226.8	1991.4	97.04	17.29	25.66	750
93	10898.	7625.	0.008	1244.2	2017.2	97.32	17.47	25.83	753
94	11015.	7708.	0.007	1261.8	2043.1	97.60	17.64	26.00	756
95	11133.	7790.	0.007	1279.6	2069.2	97.88	17.82	26.18	758
96	11250.	7873.	0.007	1297.5	2095.4	98.15	18.00	26.35	761
97	11368.	7955.	0.007	1315.6	2121.9	98.43	18.17	26.53	764
98	11485.	8038.	0.007	1333.9	2148.5	98.70	18.35	26.70	767
99	11603.	8120.	0.007	1352.3	2175.3	98.97	18.52	26.88	770
100	11720.	8203.	0.007	1371.0	2202.2	99.24	18.69	27.05	772

• TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

0.80 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 13.828	26.16	23385.	9.404	-622.8	-620.7	10.01	9.51	13.14	1274
14	26.21	22971.	9.376	-620.5	-618.4	10.17	9.56	13.29	1267
15	26.50	21505.	9.151	-606.9	-604.7	11.12	9.90	14.06	1239
16	26.82	20073.	8.937	-592.3	-590.1	12.06	10.26	14.90	1210
17	27.16	18439.	8.760	-576.9	-574.7	12.99	10.61	15.90	1178
18	27.53	16983.	8.598	-560.5	-558.2	13.93	10.94	16.96	1150
19	27.93	15690.	8.427	-543.0	-540.8	14.88	11.24	18.04	1125
* 19.538	28.16	15077.	8.329	-533.2	-530.9	15.39	11.39	18.62	1113
* 19.538	1837.1	1335.	0.047	224.0	372.9	61.66	13.03	23.91	351
20	1891.6	1385.	0.045	230.6	383.9	62.22	12.94	23.61	356
21	2007.0	1488.	0.042	244.5	407.2	63.35	12.82	23.11	367
22	2120.6	1588.	0.040	258.3	430.2	64.42	12.74	22.75	378
23	2232.8	1685.	0.038	271.8	452.8	65.43	12.68	22.49	388
24	2343.8	1781.	0.036	285.2	475.1	66.38	12.65	22.28	397
25	2453.9	1875.	0.034	298.4	497.3	67.28	12.63	22.12	406
26	2563.2	1968.	0.033	311.6	519.4	68.15	12.61	21.98	415
27	2671.9	2060.	0.031	324.7	541.3	68.98	12.59	21.87	424
28	2780.0	2151.	0.030	337.8	563.1	69.77	12.58	21.77	432
29	2887.7	2241.	0.029	350.8	584.9	70.53	12.57	21.69	441
30	2994.9	2331.	0.028	363.7	606.5	71.27	12.57	21.61	449
31	3101.8	2419.	0.027	376.7	628.1	71.97	12.56	21.55	457
32	3208.3	2508.	0.026	389.6	649.6	72.66	12.55	21.49	465
33	3314.5	2596.	0.025	402.4	671.1	73.32	12.55	21.44	472
34	3420.5	2683.	0.024	415.2	692.5	73.96	12.54	21.40	480
35	3526.3	2770.	0.024	428.0	713.9	74.58	12.54	21.36	487
36	3631.8	2857.	0.023	440.8	735.2	75.18	12.54	21.32	494
37	3737.2	2944.	0.022	453.6	756.5	75.76	12.54	21.29	501
38	3842.3	3030.	0.022	466.3	777.8	76.33	12.53	21.26	508
39	3947.4	3116.	0.021	479.1	799.1	76.88	12.54	21.24	515
40	4052.2	3201.	0.020	491.8	820.3	77.42	12.54	21.22	522
41	4157.0	3287.	0.020	504.5	841.5	77.94	12.54	21.20	528
42	4261.6	3372.	0.019	517.2	862.7	78.45	12.54	21.19	535
43	4366.1	3457.	0.019	529.9	883.9	78.95	12.55	21.17	541
44	4470.5	3542.	0.018	542.7	905.0	79.44	12.56	21.17	548
45	4574.9	3627.	0.018	555.4	926.2	79.91	12.57	21.16	554
46	4679.1	3712.	0.018	568.1	947.4	80.38	12.58	21.16	560
47	4783.2	3797.	0.017	580.8	968.5	80.83	12.60	21.16	566
48	4887.3	3881.	0.017	593.5	989.7	81.28	12.62	21.17	572
49	4991.3	3965.	0.017	606.3	1010.9	81.72	12.64	21.18	578
50	5095.3	4050.	0.016	619.0	1032.1	82.14	12.66	21.19	584
51	5199.2	4134.	0.016	631.8	1053.3	82.56	12.69	21.21	589
52	5303.0	4218.	0.016	644.6	1074.5	82.98	12.72	21.23	595
53	5406.7	4302.	0.015	657.4	1095.7	83.38	12.75	21.25	600
54	5510.5	4386.	0.015	670.3	1117.0	83.78	12.79	21.28	606
55	5614.1	4469.	0.015	683.2	1138.3	84.17	12.83	21.32	611
56	5717.8	4553.	0.014	696.1	1159.6	84.55	12.87	21.36	616
57	5821.4	4637.	0.014	709.1	1181.0	84.93	12.92	21.40	621
58	5924.9	4720.	0.014	722.2	1202.4	85.31	12.98	21.45	626
59	6028.4	4804.	0.014	735.2	1223.9	85.67	13.04	21.50	631
60	6131.9	4888.	0.013	748.4	1245.4	86.03	13.10	21.56	636
61	6235.3	4971.	0.013	761.6	1267.0	86.39	13.17	21.62	640
62	6338.7	5054.	0.013	774.9	1288.7	86.74	13.24	21.69	645
63	6442.1	5138.	0.013	788.2	1310.4	87.09	13.32	21.76	650
64	6545.5	5221.	0.013	801.6	1332.2	87.43	13.40	21.84	654
65	6648.8	5304.	0.012	815.1	1354.1	87.77	13.49	21.92	658
66	6752.1	5388.	0.012	828.7	1376.1	88.11	13.58	22.01	663
67	6855.4	5471.	0.012	842.4	1398.1	88.44	13.67	22.10	667
68	6958.6	5554.	0.012	856.2	1420.3	88.77	13.77	22.20	671
69	7061.9	5637.	0.012	870.1	1442.5	89.09	13.88	22.30	675
70	7165.1	5720.	0.011	884.1	1464.9	89.41	13.99	22.40	679
71	7268.3	5803.	0.011	898.2	1487.3	89.73	14.10	22.52	682
72	7371.4	5886.	0.011	912.4	1509.9	90.05	14.22	22.63	686
73	7474.6	5969.	0.011	926.7	1532.6	90.36	14.35	22.75	690
74	7577.7	6052.	0.011	941.1	1555.4	90.67	14.47	22.88	693
75	7680.8	6135.	0.011	955.7	1578.3	90.98	14.60	23.01	697
76	7783.9	6218.	0.011	970.4	1601.4	91.29	14.74	23.14	700
77	7887.0	6301.	0.010	985.3	1624.6	91.59	14.88	23.27	704
78	7990.1	6384.	0.010	1000.3	1648.0	91.89	15.02	23.42	707
79	8093.2	6466.	0.010	1015.4	1671.5	92.19	15.17	23.56	711
80	8196.2	6549.	0.010	1030.7	1695.1	92.49	15.32	23.71	714
81	8299.3	6632.	0.010	1046.1	1718.9	92.78	15.47	23.86	717
82	8402.3	6715.	0.010	1061.7	1742.8	93.08	15.62	24.01	720
83	8505.3	6798.	0.010	1077.5	1766.9	93.37	15.78	24.17	723
84	8608.3	6880.	0.010	1093.4	1791.1	93.66	15.94	24.33	726
85	8711.3	6963.	0.009	1109.4	1815.5	93.95	16.11	24.49	729
86	8814.2	7046.	0.009	1125.6	1840.1	94.23	16.27	24.65	732
87	8917.2	7128.	0.009	1142.0	1864.8	94.52	16.44	24.82	735
88	9020.2	7211.	0.009	1158.6	1889.7	94.81	16.61	24.98	738
89	9123.1	7294.	0.009	1175.3	1914.8	95.09	16.78	25.15	741
90	9226.1	7376.	0.009	1192.2	1940.1	95.37	16.95	25.32	744
91	9329.0	7459.	0.009	1209.3	1965.5	95.65	17.12	25.49	747
92	9431.9	7542.	0.009	1226.5	1991.0	95.93	17.30	25.67	750
93	9534.8	7624.	0.009	1243.9	2016.8	96.21	17.47	25.84	753
94	9637.7	7707.	0.009	1261.5	2042.7	96.49	17.64	26.01	756
95	9740.6	7789.	0.008	1279.2	2068.8	96.76	17.82	26.19	758
96	9843.5	7872.	0.008	1297.2	2095.1	97.04	18.00	26.36	761
97	9946.4	7955.	0.008	1315.3	2121.5	97.31	18.17	26.53	764
98	10049.	8037.	0.008	1333.6	2148.2	97.58	18.35	26.71	767
99	10152.	8120.	0.008	1352.0	2175.0	97.86	18.52	26.88	770
100	10255.	8202.	0.008	1370.7	2201.9	98.13	18.70	27.06	772

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

0.90 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
• 13.831	26.16	23395.	9.404	-622.8	-620.4	10.01	9.51	13.14	1274
14	26.21	22980.	9.377	-620.6	-618.2	10.17	9.57	13.29	1267
15	26.50	21524.	9.154	-606.9	-604.5	11.11	9.90	14.06	1239
16	26.82	20091.	8.939	-592.4	-589.9	12.05	10.26	14.89	1211
17	27.16	18453.	8.762	-576.9	-574.5	12.99	10.61	15.90	1179
18	27.52	17006.	8.601	-560.5	-558.0	13.93	10.94	16.95	1151
19	27.92	15712.	8.430	-543.1	-540.6	14.87	11.24	18.03	1125
• 19.918	28.32	14626.	8.266	-526.1	-523.5	15.75	11.49	19.05	1104
• 19.918	1652.7	1340.	0.052	226.6	377.4	60.99	13.07	24.21	353
20	1661.6	1349.	0.052	227.8	379.3	61.09	13.05	24.15	354
21	1766.2	1456.	0.048	242.1	403.2	62.25	12.89	23.52	365
22	1868.7	1559.	0.045	256.0	426.5	63.34	12.79	23.08	376
23	1969.7	1659.	0.043	269.7	449.4	64.35	12.72	22.76	386
24	2069.6	1756.	0.041	283.3	472.0	65.32	12.68	22.51	396
25	2168.4	1852.	0.039	296.7	494.4	66.23	12.65	22.31	405
26	2266.4	1947.	0.037	310.0	516.6	67.10	12.63	22.15	414
27	2363.8	2040.	0.035	323.2	538.7	67.94	12.61	22.02	423
28	2460.6	2132.	0.034	336.3	560.7	68.74	12.60	21.91	432
29	2556.9	2223.	0.033	349.4	582.5	69.50	12.59	21.81	440
30	2652.8	2314.	0.031	362.4	604.3	70.24	12.58	21.73	448
31	2748.3	2404.	0.030	375.4	626.0	70.95	12.57	21.65	456
32	2843.4	2493.	0.029	388.3	647.6	71.64	12.56	21.59	464
33	2938.3	2581.	0.028	401.2	669.2	72.30	12.56	21.53	472
34	3032.9	2670.	0.027	414.1	690.7	72.94	12.55	21.48	479
35	3127.3	2757.	0.027	427.0	712.1	73.57	12.55	21.43	487
36	3221.4	2845.	0.026	439.8	733.6	74.17	12.54	21.39	494
37	3315.4	2932.	0.025	452.6	754.9	74.76	12.54	21.35	501
38	3409.2	3019.	0.024	465.4	776.3	75.32	12.54	21.32	508
39	3502.8	3105.	0.024	478.1	797.6	75.88	12.54	21.29	515
40	3596.3	3191.	0.023	490.9	818.9	76.42	12.54	21.27	522
41	3689.7	3277.	0.022	503.7	840.1	76.94	12.55	21.25	528
42	3782.9	3363.	0.022	516.4	861.4	77.45	12.55	21.23	535
43	3876.0	3449.	0.021	529.1	882.6	77.95	12.56	21.22	541
44	3969.0	3534.	0.021	541.9	903.8	78.44	12.56	21.21	548
45	4062.0	3619.	0.020	554.6	925.0	78.92	12.57	21.20	554
46	4154.8	3704.	0.020	567.3	946.2	79.38	12.59	21.20	560
47	4247.6	3789.	0.019	580.1	967.4	79.84	12.60	21.20	566
48	4340.3	3874.	0.019	592.8	988.6	80.29	12.62	21.20	572
49	4432.9	3958.	0.019	605.6	1009.8	80.72	12.64	21.21	578
50	4525.4	4043.	0.018	618.4	1031.0	81.15	12.66	21.22	584
51	4617.9	4127.	0.018	631.1	1052.3	81.57	12.69	21.24	589
52	4710.3	4212.	0.018	644.0	1073.5	81.98	12.72	21.26	595
53	4802.7	4296.	0.017	656.8	1094.8	82.39	12.75	21.28	600
54	4895.0	4380.	0.017	669.7	1116.1	82.79	12.79	21.31	606
55	4987.3	4464.	0.017	682.6	1137.4	83.18	12.83	21.34	611
56	5079.5	4548.	0.016	695.6	1158.8	83.56	12.88	21.38	616
57	5171.7	4632.	0.016	708.6	1180.2	83.94	12.93	21.42	621
58	5263.9	4716.	0.016	721.6	1201.6	84.32	12.98	21.47	626
59	5356.0	4799.	0.015	734.7	1223.1	84.68	13.04	21.52	631
60	5448.1	4883.	0.015	747.8	1244.7	85.05	13.10	21.58	636
61	5540.1	4967.	0.015	761.1	1266.3	85.40	13.17	21.64	640
62	5632.1	5050.	0.015	774.3	1288.0	85.76	13.24	21.71	645
63	5724.1	5134.	0.014	787.7	1309.7	86.10	13.32	21.78	650
64	5816.1	5217.	0.014	801.1	1331.5	86.45	13.40	21.85	654
65	5908.0	5301.	0.014	814.6	1353.4	86.79	13.49	21.94	658
66	5999.9	5384.	0.014	828.2	1375.4	87.12	13.58	22.02	662
67	6091.8	5467.	0.014	841.9	1397.5	87.45	13.67	22.11	667
68	6183.6	5551.	0.013	855.7	1419.6	87.78	13.78	22.21	671
69	6275.5	5634.	0.013	869.6	1441.9	88.11	13.88	22.31	675
70	6367.3	5717.	0.013	883.6	1464.3	88.43	13.99	22.42	679
71	6459.1	5800.	0.013	897.7	1486.7	88.75	14.10	22.53	682
72	6550.8	5883.	0.013	911.9	1509.3	89.06	14.22	22.65	686
73	6642.6	5966.	0.012	926.3	1532.0	89.38	14.35	22.76	690
74	6734.3	6049.	0.012	940.7	1554.9	89.69	14.47	22.89	693
75	6826.1	6133.	0.012	955.3	1577.8	90.00	14.61	23.02	697
76	6917.8	6216.	0.012	970.0	1600.9	90.30	14.74	23.15	700
77	7009.5	6299.	0.012	984.9	1624.1	90.60	14.88	23.29	704
78	7101.1	6381.	0.012	999.9	1647.5	90.91	15.02	23.43	707
79	7192.8	6464.	0.011	1015.0	1671.0	91.21	15.17	23.57	711
80	7284.5	6547.	0.011	1030.3	1694.6	91.50	15.32	23.72	714
81	7376.1	6630.	0.011	1045.8	1718.4	91.80	15.47	23.87	717
82	7467.7	6713.	0.011	1061.4	1742.3	92.09	15.62	24.02	720
83	7559.3	6796.	0.011	1077.1	1766.4	92.38	15.78	24.18	723
84	7650.9	6879.	0.011	1093.0	1790.7	92.67	15.94	24.33	726
85	7742.5	6962.	0.011	1109.1	1815.1	92.96	16.11	24.50	729
86	7834.1	7044.	0.011	1125.3	1839.7	93.25	16.27	24.66	732
87	7925.7	7127.	0.010	1141.7	1864.4	93.54	16.44	24.82	735
88	8017.2	7210.	0.010	1158.2	1889.3	93.82	16.61	24.99	738
89	8108.8	7293.	0.010	1175.0	1914.4	94.11	16.78	25.16	741
90	8200.3	7375.	0.010	1191.9	1939.7	94.39	16.95	25.33	744
91	8291.9	7458.	0.010	1208.9	1965.1	94.67	17.12	25.50	747
92	8383.4	7541.	0.010	1226.2	1990.7	94.95	17.30	25.67	750
93	8474.9	7623.	0.010	1243.6	2016.4	95.23	17.47	25.85	753
94	8566.4	7706.	0.010	1261.2	2042.4	95.50	17.65	26.02	756
95	8657.9	7788.	0.010	1278.9	2068.5	95.78	17.82	26.19	759
96	8749.4	7871.	0.009	1296.9	2094.8	96.06	18.00	26.37	761
97	8840.9	7954.	0.009	1315.0	2121.2	96.33	18.17	26.54	764
98	8932.4	8036.	0.009	1333.3	2147.8	96.60	18.35	26.72	767
99	9023.8	8119.	0.009	1351.7	2174.6	96.87	18.52	26.89	770
100	9115.3	8202.	0.009	1370.4	2201.6	97.15	18.70	27.06	772

• TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

1.00 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME $CM^3/GMOLE$	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 13.835	26.16	2340[illegible].	9.405	-622.8	-620.2	10.01	9.51	13.14	1275
14	26.21	23007.	9.378	-620.6	-618.0	10.17	9.57	13.29	1267
15	26.50	21543.	9.156	-607.0	-604.3	11.11	9.90	14.06	1240
16	26.81	20119.	8.942	-592.4	-589.7	12.05	10.26	14.89	1211
17	27.15	18474.	8.765	-577.0	-574.2	12.99	10.61	15.89	1179
18	27.52	17028.	8.603	-560.6	-557.8	13.93	10.94	16.94	1151
19	27.92	15734.	8.433	-543.2	-540.4	14.87	11.24	18.02	1126
20	28.35	14543.	8.254	-524.7	-521.8	15.82	11.51	19.14	1103
* 20.268	28.48	14091.	8.204	-519.5	-516.6	16.08	11.57	19.53	1093
* 20.268	1506.9	1343.	0.057	229.0	381.7	60.41	13.11	24.50	355
21	1573.1	1423.	0.055	239.6	399.0	61.25	12.97	23.97	363
22	1667.0	1529.	0.051	253.8	422.7	62.35	12.85	23.43	374
23	1759.1	1631.	0.048	267.7	445.9	63.38	12.77	23.04	385
24	1850.0	1731.	0.046	281.3	468.8	64.36	12.71	22.75	395
25	1939.9	1829.	0.043	294.9	491.4	65.28	12.68	22.52	404
26	2028.9	1925.	0.041	308.3	513.9	66.16	12.65	22.33	413
27	2117.2	2020.	0.040	321.6	536.1	67.00	12.63	22.18	422
28	2205.0	2113.	0.038	334.8	558.2	67.81	12.61	22.05	431
29	2292.2	2205.	0.037	348.0	580.2	68.58	12.60	21.94	439
30	2379.0	2297.	0.035	361.1	602.1	69.32	12.59	21.84	448
31	2465.4	2388.	0.034	374.1	623.9	70.03	12.58	21.76	456
32	2551.5	2478.	0.033	387.1	645.6	70.72	12.57	21.68	463
33	2637.3	2567.	0.032	400.1	667.3	71.39	12.57	21.62	471
34	2722.8	2656.	0.031	413.0	688.9	72.04	12.56	21.56	479
35	2808.1	2745.	0.030	425.9	710.4	72.66	12.56	21.51	486
36	2893.1	2833.	0.029	438.7	731.9	73.26	12.55	21.46	493
37	2978.0	2920.	0.028	451.6	753.3	73.85	12.55	21.42	501
38	3062.7	3007.	0.027	464.4	774.7	74.42	12.55	21.38	508
39	3147.2	3094.	0.026	477.2	796.1	74.98	12.55	21.35	514
40	3231.6	3181.	0.026	490.0	817.4	75.52	12.55	21.32	521
41	3315.8	3268.	0.025	502.8	838.7	76.04	12.55	21.30	528
42	3399.9	3354.	0.024	515.5	860.0	76.56	12.55	21.28	535
43	3483.9	3440.	0.024	528.3	881.3	77.06	12.56	21.26	541
44	3567.8	3525.	0.023	541.1	902.6	77.55	12.57	21.25	547
45	3651.7	3611.	0.023	553.8	923.8	78.02	12.58	21.24	554
46	3735.4	3696.	0.022	566.6	945.1	78.49	12.59	21.24	560
47	3819.0	3782.	0.022	579.3	966.3	78.95	12.60	21.23	566
48	3902.6	3867.	0.021	592.1	987.5	79.39	12.62	21.24	572
49	3986.1	3952.	0.021	604.9	1008.8	79.83	12.64	21.24	578
50	4069.5	4036.	0.020	617.7	1030.0	80.26	12.67	21.25	583
51	4152.9	4121.	0.020	630.5	1051.3	80.68	12.69	21.27	589
52	4236.2	4206.	0.020	643.3	1072.6	81.10	12.72	21.29	595
53	4319.5	4290.	0.019	656.2	1093.9	81.50	12.76	21.31	600
54	4402.7	4374.	0.019	669.1	1115.2	81.90	12.79	21.34	606
55	4485.8	4459.	0.018	682.0	1136.5	82.29	12.83	21.37	611
56	4568.9	4543.	0.018	695.0	1157.9	82.68	12.88	21.40	616
57	4652.0	4627.	0.018	708.0	1179.3	83.06	12.93	21.45	621
58	4735.0	4711.	0.017	721.0	1200.8	83.43	12.98	21.49	626
59	4818.0	4795.	0.017	734.1	1222.3	83.80	13.04	21.54	631
60	4901.0	4879.	0.017	747.3	1243.9	84.16	13.10	21.60	636
61	4983.9	4962.	0.017	760.5	1265.5	84.52	13.17	21.66	640
62	5066.8	5046.	0.016	773.8	1287.2	84.87	13.24	21.73	645
63	5149.7	5130.	0.016	787.2	1309.0	85.22	13.32	21.80	650
64	5232.5	5213.	0.016	800.6	1330.8	85.56	13.40	21.87	654
65	5315.3	5297.	0.016	814.2	1352.7	85.90	13.49	21.95	658
66	5398.1	5380.	0.015	827.8	1374.7	86.24	13.58	22.04	662
67	5480.9	5464.	0.015	841.5	1396.8	86.57	13.68	22.13	667
68	5563.6	5547.	0.015	855.3	1419.0	86.90	13.78	22.23	671
69	5646.3	5631.	0.015	869.2	1441.3	87.22	13.88	22.33	675
70	5729.0	5714.	0.014	883.2	1463.7	87.55	13.99	22.43	679
71	5811.7	5797.	0.014	897.3	1486.1	87.87	14.11	22.54	682
72	5894.4	5881.	0.014	911.5	1508.8	88.18	14.22	22.66	686
73	5977.0	5964.	0.014	925.8	1531.5	88.50	14.35	22.78	690
74	6059.6	6047.	0.014	940.3	1554.3	88.81	14.47	22.90	693
75	6142.2	6130.	0.013	954.9	1577.3	89.11	14.61	23.03	697
76	6224.8	6213.	0.013	969.6	1600.4	89.42	14.74	23.16	700
77	6307.4	6296.	0.013	984.5	1623.6	89.72	14.88	23.30	704
78	6390.0	6379.	0.013	999.5	1647.0	90.03	15.02	23.44	707
79	6472.5	6462.	0.013	1014.7	1670.5	90.32	15.17	23.58	711
80	6555.0	6545.	0.013	1029.9	1694.1	90.62	15.32	23.73	714
81	6637.6	6628.	0.012	1045.4	1717.9	90.92	15.47	23.88	717
82	6720.1	6711.	0.012	1061.0	1741.9	91.21	15.63	24.03	720
83	6802.6	6794.	0.012	1076.7	1766.0	91.50	15.78	24.19	723
84	6885.0	6877.	0.012	1092.6	1790.3	91.79	15.94	24.34	726
85	6967.5	6960.	0.012	1108.7	1814.7	92.08	16.11	24.50	730
86	7050.0	7043.	0.012	1124.9	1839.3	92.37	16.27	24.67	733
87	7132.4	7126.	0.012	1141.3	1864.0	92.66	16.44	24.83	736
88	7214.9	7209.	0.011	1157.9	1888.9	92.94	16.61	25.00	738
89	7297.3	7291.	0.011	1174.6	1914.0	93.23	16.78	25.17	741
90	7379.7	7374.	0.011	1191.5	1939.3	93.51	16.95	25.34	744
91	7462.1	7457.	0.011	1208.6	1964.7	93.79	17.12	25.51	747
92	7544.6	7540.	0.011	1225.9	1990.3	94.07	17.30	25.68	750
93	7627.0	7623.	0.011	1243.3	2016.1	94.35	17.47	25.85	753
94	7709.3	7705.	0.011	1260.9	2042.0	94.62	17.65	26.03	756
95	7791.7	7788.	0.011	1278.6	2068.1	94.90	17.82	26.20	759
96	7874.1	7871.	0.010	1296.6	2094.4	95.18	18.00	26.37	761
97	7956.5	7953.	0.010	1314.7	2120.9	95.45	18.17	26.55	764
98	8038.8	8036.	0.010	1333.0	2147.5	95.72	18.35	26.72	767
99	8121.2	8119.	0.010	1351.4	2174.3	96.00	18.52	26.90	770
100	8203.5	8201.	0.010	1370.1	2201.3	96.27	18.70	27.07	773

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

1.50 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME $CM^3/GMOLE$	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 13.852	26.15	23457.	9.407	-622.8	-618.8	10.01	9.52	13.14	1276
14	26.19	23098.	9.383	-620.8	-616.8	10.15	9.57	13.28	1269
15	26.48	21638.	9.169	-607.2	-603.2	11.09	9.90	14.04	1242
16	26.79	20203.	8.956	-592.7	-588.6	12.03	10.26	14.88	1214
17	27.13	18579.	8.779	-577.3	-573.2	12.97	10.61	15.87	1182
18	27.50	17140.	8.618	-560.9	-556.8	13.91	10.94	16.91	1154
19	27.89	15843.	8.448	-543.6	-539.3	14.85	11.24	17.99	1129
20	28.33	14643.	8.269	-525.1	-520.8	15.80	11.51	19.10	1105
21	28.81	13184.	8.066	-505.4	-501.0	16.76	11.74	20.45	1075
* 21.722	29.19	12268.	7.904	-490.3	-485.9	17.47	11.89	21.43	1054
* 21.722	1040.8	1338.	0.084	237.2	395.4	58.07	13.30	25.94	362
22	1058.5	1371.	0.083	241.5	402.4	58.38	13.22	25.64	366
23	1124.9	1489.	0.077	256.6	427.6	59.50	13.03	24.77	377
24	1189.6	1601.	0.072	271.2	452.0	60.54	12.90	24.15	388
25	1252.9	1709.	0.068	285.5	475.9	61.52	12.82	23.69	398
26	1315.2	1814.	0.065	299.6	499.4	62.44	12.77	23.34	408
27	1376.7	1916.	0.062	313.4	522.6	63.32	12.73	23.05	418
28	1437.4	2016.	0.059	327.1	545.6	64.15	12.70	22.82	427
29	1497.6	2115.	0.056	340.7	568.3	64.95	12.68	22.62	436
30	1557.3	2212.	0.054	354.1	590.8	65.71	12.66	22.46	444
31	1616.5	2307.	0.052	367.5	613.2	66.45	12.64	22.32	452
32	1675.4	2402.	0.050	380.8	635.5	67.15	12.63	22.19	461
33	1734.0	2495.	0.048	394.1	657.6	67.84	12.62	22.08	468
34	1792.2	2588.	0.047	407.3	679.6	68.49	12.61	21.99	476
35	1850.2	2680.	0.045	420.4	701.6	69.13	12.60	21.90	484
36	1908.0	2771.	0.044	433.5	723.4	69.75	12.59	21.82	491
37	1965.6	2862.	0.043	446.5	745.2	70.34	12.59	21.76	499
38	2022.9	2952.	0.041	459.5	767.0	70.92	12.58	21.70	506
39	2080.2	3041.	0.040	472.5	788.6	71.48	12.58	21.64	513
40	2137.2	3130.	0.039	485.4	810.3	72.03	12.58	21.60	520
41	2194.1	3219.	0.038	498.4	831.8	72.56	12.58	21.56	527
42	2250.9	3307.	0.037	511.3	853.4	73.08	12.58	21.52	533
43	2307.6	3395.	0.036	524.2	874.9	73.59	12.58	21.49	540
44	2364.2	3483.	0.035	537.0	896.4	74.08	12.59	21.47	546
45	2420.7	3570.	0.034	549.9	917.8	74.57	12.60	21.45	553
46	2477.1	3657.	0.034	562.8	939.3	75.04	12.61	21.43	559
47	2533.4	3744.	0.033	575.6	960.7	75.50	12.62	21.42	565
48	2589.6	3831.	0.032	588.5	982.1	75.95	12.64	21.41	571
49	2645.8	3917.	0.031	601.4	1003.5	76.39	12.66	21.41	577
50	2701.8	4003.	0.031	614.3	1024.9	76.82	12.68	21.41	583
51	2757.9	4089.	0.030	627.2	1046.3	77.25	12.71	21.42	589
52	2813.8	4175.	0.029	640.1	1067.8	77.66	12.74	21.43	594
53	2869.7	4261.	0.029	653.0	1089.2	78.07	12.77	21.45	600
54	2925.6	4346.	0.028	666.0	1110.7	78.47	12.81	21.47	605
55	2981.4	4431.	0.028	679.0	1132.1	78.87	12.85	21.49	610
56	3037.2	4517.	0.027	692.0	1153.6	79.25	12.89	21.52	616
57	3092.9	4602.	0.027	705.1	1175.2	79.64	12.94	21.56	621
58	3148.6	4687.	0.026	718.2	1196.8	80.01	12.99	21.60	626
59	3204.2	4772.	0.026	731.4	1218.4	80.38	13.05	21.65	631
60	3259.8	4856.	0.025	744.6	1240.1	80.74	13.11	21.70	636
61	3315.4	4941.	0.025	757.9	1261.8	81.10	13.18	21.76	640
62	3371.0	5026.	0.025	771.2	1283.6	81.46	13.25	21.82	645
63	3426.5	5110.	0.024	784.7	1305.4	81.81	13.33	21.89	649
64	3482.0	5194.	0.024	798.2	1327.4	82.15	13.41	21.96	654
65	3537.4	5279.	0.023	811.7	1349.4	82.49	13.50	22.04	658
66	3592.9	5363.	0.023	825.4	1371.4	82.83	13.59	22.12	662
67	3648.3	5447.	0.023	839.1	1393.6	83.16	13.68	22.21	667
68	3703.7	5531.	0.022	853.0	1415.9	83.49	13.78	22.30	671
69	3759.0	5615.	0.022	866.9	1438.2	83.82	13.89	22.40	675
70	3814.4	5699.	0.022	880.9	1460.7	84.14	14.00	22.50	679
71	3869.7	5783.	0.021	895.1	1483.2	84.46	14.11	22.61	682
72	3925.0	5867.	0.021	909.4	1505.9	84.78	14.23	22.72	686
73	3980.3	5951.	0.021	923.7	1528.7	85.09	14.35	22.84	690
74	4035.5	6034.	0.020	938.2	1551.6	85.41	14.48	22.96	694
75	4090.8	6118.	0.020	952.9	1574.6	85.72	14.61	23.09	697
76	4146.0	6202.	0.020	967.6	1597.8	86.02	14.75	23.22	701
77	4201.3	6285.	0.020	982.5	1621.1	86.33	14.89	23.35	704
78	4256.5	6369.	0.019	997.6	1644.5	86.63	15.03	23.49	707
79	4311.7	6452.	0.019	1012.7	1668.0	86.93	15.17	23.63	711
80	4366.8	6536.	0.019	1028.1	1691.8	87.23	15.32	23.78	714
81	4422.0	6619.	0.019	1043.5	1715.6	87.52	15.47	23.93	717
82	4477.1	6703.	0.018	1059.1	1739.6	87.82	15.63	24.08	720
83	4532.3	6786.	0.018	1074.9	1763.8	88.11	15.79	24.23	724
84	4587.4	6869.	0.018	1090.9	1788.1	88.40	15.95	24.39	727
85	4642.5	6953.	0.018	1106.9	1812.6	88.69	16.11	24.55	730
86	4697.6	7036.	0.018	1123.2	1837.2	88.98	16.28	24.71	733
87	4752.7	7119.	0.017	1139.6	1862.0	89.27	16.44	24.88	736
88	4807.8	7203.	0.017	1156.2	1886.9	89.55	16.61	25.04	739
89	4862.9	7286.	0.017	1173.0	1912.1	89.84	16.78	25.21	742
90	4918.0	7369.	0.017	1189.9	1937.4	90.12	16.95	25.38	745
91	4973.0	7452.	0.017	1207.0	1962.8	90.40	17.13	25.55	747
92	5028.1	7535.	0.016	1224.3	1988.5	90.68	17.30	25.72	750
93	5083.1	7618.	0.016	1241.7	2014.3	90.96	17.47	25.89	753
94	5138.2	7701.	0.016	1259.3	2040.2	91.24	17.65	26.06	756
95	5193.2	7784.	0.016	1277.1	2066.4	91.51	17.82	26.24	759
96	5248.2	7867.	0.016	1295.0	2092.7	91.79	18.00	26.41	762
97	5303.2	7950.	0.016	1313.2	2119.2	92.06	18.17	26.58	764
98	5358.3	8033.	0.015	1331.5	2145.9	92.34	18.35	26.76	767
99	5413.3	8116.	0.015	1350.0	2172.7	92.61	18.52	26.93	770
100	5468.2	8199.	0.015	1368.6	2199.7	92.88	18.70	27.10	773

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

2.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME $CM^3/GMOLE$	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
• 13.869	26.14	23507.	9.408	-622.7	-617.4	10.01	9.53	13.14	1277
14	26.18	23184.	9.387	-621.0	-615.7	10.14	9.57	13.26	1271
15	26.46	21732.	9.181	-607.4	-602.0	11.08	9.90	14.03	1244
16	26.78	20297.	8.969	-592.9	-587.5	12.02	10.26	14.86	1216
17	27.11	18685.	8.792	-577.6	-572.1	12.95	10.60	15.84	1184
18	27.47	17251.	8.632	-561.3	-555.7	13.89	10.93	16.88	1157
19	27.87	15957.	8.463	-544.0	-538.3	14.83	11.23	17.95	1132
20	28.30	14747.	8.284	-525.6	-519.8	15.78	11.50	19.06	1108
21	28.78	13598.	8.083	-505.9	-500.1	16.74	11.73	20.39	1078
22	29.31	12004.	7.856	-485.0	-479.0	17.72	11.94	21.78	1049
• 22.861	29.82	10690.	7.620	-465.7	-459.7	18.58	12.09	23.28	1017
• 22.861	796.51	1314.	0.112	241.9	403.4	56.36	13.44	27.39	367
23	804.24	1333.	0.110	244.2	407.2	56.53	13.40	27.18	369
24	856.72	1461.	0.102	260.1	433.7	57.66	13.16	26.00	381
25	907.42	1587.	0.096	275.4	459.3	58.70	13.01	25.17	392
26	956.79	1697.	0.091	290.2	484.1	59.67	12.91	24.55	403
27	1005.1	1808.	0.086	304.7	508.4	60.59	12.85	24.08	413
28	1052.6	1916.	0.082	319.0	532.3	61.46	12.80	23.71	422
29	1099.5	2021.	0.078	333.1	555.9	62.29	12.76	23.40	432
30	1145.8	2124.	0.074	347.0	579.2	63.08	12.74	23.15	441
31	1191.5	2225.	0.071	360.7	602.2	63.83	12.71	22.93	449
32	1236.9	2324.	0.069	374.4	625.0	64.56	12.69	22.75	458
33	1281.9	2422.	0.066	387.9	647.7	65.25	12.68	22.59	466
34	1326.6	2519.	0.064	401.4	670.2	65.93	12.66	22.44	474
35	1371.0	2614.	0.062	414.8	692.6	66.57	12.64	22.32	482
36	1415.2	2709.	0.060	428.1	714.9	67.20	12.63	22.21	489
37	1459.2	2803.	0.058	441.3	737.0	67.81	12.62	22.11	497
38	1502.9	2895.	0.056	454.5	759.1	68.40	12.61	22.03	504
39	1546.5	2987.	0.054	467.7	781.1	68.97	12.61	21.95	511
40	1589.9	3079.	0.053	480.8	803.0	69.52	12.61	21.88	518
41	1633.2	3170.	0.051	493.9	824.9	70.06	12.60	21.82	525
42	1676.4	3260.	0.050	506.9	846.6	70.59	12.61	21.77	532
43	1719.4	3350.	0.049	520.0	868.4	71.10	12.61	21.73	539
44	1762.3	3440.	0.047	533.0	890.1	71.60	12.61	21.69	545
45	1805.2	3529.	0.046	546.0	911.8	72.09	12.62	21.65	552
46	1847.9	3618.	0.045	558.9	933.4	72.56	12.63	21.63	558
47	1890.5	3706.	0.044	571.9	955.0	73.03	12.64	21.60	564
48	1933.1	3795.	0.043	584.9	976.6	73.48	12.66	21.59	570
49	1975.6	3882.	0.042	597.9	998.2	73.93	12.68	21.58	576
50	2018.0	3970.	0.041	610.8	1019.8	74.36	12.70	21.57	582
51	2060.4	4057.	0.040	623.8	1041.4	74.79	12.72	21.57	588
52	2102.7	4144.	0.040	636.8	1062.9	75.21	12.75	21.57	594
53	2144.9	4231.	0.039	649.9	1084.5	75.62	12.78	21.58	599
54	2187.1	4319.	0.038	662.9	1106.1	76.02	12.82	21.60	605
55	2229.2	4404.	0.037	676.0	1127.7	76.42	12.86	21.62	610
56	2271.3	4491.	0.037	689.1	1149.4	76.81	12.90	21.65	615
57	2313.4	4577.	0.036	702.2	1171.0	77.19	12.95	21.68	620
58	2355.4	4663.	0.035	715.4	1192.7	77.57	13.00	21.71	626
59	2397.3	4749.	0.035	728.6	1214.4	77.94	13.06	21.76	630
60	2439.3	4834.	0.034	741.9	1236.2	78.31	13.12	21.80	635
61	2481.2	4920.	0.033	755.2	1258.1	78.67	13.19	21.86	640
62	2523.1	5005.	0.033	768.6	1279.9	79.02	13.26	21.91	645
63	2564.9	5090.	0.032	782.1	1301.9	79.38	13.34	21.98	649
64	2606.7	5176.	0.032	795.7	1323.9	79.72	13.42	22.05	654
65	2648.5	5261.	0.031	809.3	1346.0	80.06	13.50	22.12	658
66	2690.2	5346.	0.031	823.0	1368.2	80.40	13.60	22.20	662
67	2732.0	5430.	0.030	836.8	1390.4	80.74	13.69	22.29	667
68	2773.7	5515.	0.030	850.6	1412.7	81.07	13.79	22.38	671
69	2815.4	5600.	0.029	864.6	1435.2	81.40	13.90	22.47	675
70	2857.0	5685.	0.029	878.7	1457.7	81.72	14.00	22.58	679
71	2898.7	5769.	0.029	892.9	1480.3	82.04	14.12	22.68	682
72	2940.3	5853.	0.028	907.2	1503.1	82.36	14.24	22.79	686
73	2981.9	5938.	0.028	921.6	1525.9	82.67	14.36	22.91	690
74	3023.5	6027.	0.027	936.2	1548.9	82.99	14.49	23.03	694
75	3065.1	6106.	0.027	950.8	1572.0	83.30	14.62	23.15	697
76	3106.7	6191.	0.027	965.6	1595.2	83.60	14.75	23.28	701
77	3148.2	6275.	0.026	980.5	1618.5	83.91	14.89	23.41	704
78	3189.7	6359.	0.026	995.6	1642.0	84.21	15.03	23.55	708
79	3231.2	6443.	0.026	1010.8	1665.6	84.51	15.18	23.69	711
80	3272.7	6527.	0.025	1026.2	1689.4	84.81	15.33	23.83	714
81	3314.2	6611.	0.025	1041.7	1713.3	85.11	15.48	23.98	717
82	3355.7	6694.	0.025	1057.3	1737.3	85.40	15.63	24.13	721
83	3397.2	6778.	0.024	1073.1	1761.5	85.70	15.79	24.28	724
84	3438.6	6862.	0.024	1089.1	1785.9	85.99	15.95	24.44	727
85	3480.1	6946.	0.024	1105.2	1810.4	86.28	16.12	24.60	730
86	3521.5	7029.	0.023	1121.5	1835.1	86.57	16.28	24.76	733
87	3562.9	7113.	0.023	1137.9	1859.9	86.86	16.45	24.92	736
88	3604.3	7196.	0.023	1154.5	1884.9	87.14	16.62	25.08	739
89	3645.7	7280.	0.023	1171.3	1910.1	87.43	16.79	25.25	742
90	3687.1	7363.	0.022	1188.2	1935.4	87.71	16.96	25.42	745
91	3728.5	7447.	0.022	1205.4	1960.9	87.99	17.13	25.59	748
92	3769.9	7530.	0.022	1222.6	1986.6	88.27	17.30	25.76	751
93	3811.3	7614.	0.022	1240.1	2012.5	88.55	17.48	25.93	753
94	3852.6	7697.	0.021	1257.7	2038.5	88.83	17.65	26.10	756
95	3894.0	7781.	0.021	1275.5	2064.7	89.11	17.83	26.27	759
96	3935.3	7864.	0.021	1293.5	2091.0	89.38	18.00	26.44	762
97	3976.6	7947.	0.021	1311.7	2117.5	89.66	18.18	26.62	765
98	4018.0	8030.	0.021	1330.0	2144.2	89.93	18.35	26.79	768
99	4059.3	8114.	0.020	1348.5	2171.1	90.20	18.53	26.96	770
100	4100.6	8197.	0.020	1367.2	2198.2	90.47	18.70	27.13	773

• TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

3.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME $\frac{3}{CM/GMOLE}$	$(\partial P/\partial\rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
• 13.903	26.12	23605.	9.412	-622.7	-614.7	10.02	9.54	13.15	1279
14	26.15	23361.	9.397	-621.4	-613.4	10.11	9.57	13.24	1274
15	26.43	21927.	9.206	-607.8	-599.8	11.05	9.90	14.01	1248
16	26.74	20483.	8.996	-593.4	-585.3	11.99	10.25	14.83	1220
17	27.07	18893.	8.819	-578.2	-569.9	12.92	10.60	15.80	1190
18	27.43	17471.	8.660	-562.0	-553.6	13.85	10.93	16.82	1163
19	27.82	16168.	8.493	-544.7	-536.3	14.79	11.23	17.87	1137
20	28.25	14941.	8.313	-526.5	-517.9	15.73	11.50	18.97	1113
21	28.71	13524.	8.117	-507.0	-498.3	16.69	11.73	20.27	1084
22	29.24	12227.	7.891	-486.2	-477.3	17.66	11.93	21.63	1056
23	29.83	10739.	7.621	-463.9	-454.8	18.66	12.10	23.32	1020
24	30.50	9368.	7.309	-439.9	-430.7	19.69	12.25	25.15	983
• 24.632	30.98	8484.	7.088	-423.8	-414.4	20.36	12.33	26.52	958
• 24.632	541.72	1240.	0.169	245.3	410.0	53.85	13.68	30.46	373
25	556.47	1297.	0.163	252.0	421.2	54.30	13.56	29.65	378
26	594.35	1442.	0.151	269.3	449.9	55.43	13.31	27.99	390
27	630.55	1577.	0.141	285.7	477.3	56.46	13.15	26.84	402
28	665.51	1704.	0.132	301.4	503.7	57.42	13.04	25.99	413
29	699.50	1825.	0.125	316.7	529.4	58.32	12.97	25.33	423
30	732.73	1942.	0.119	331.7	554.4	59.17	12.91	24.81	433
31	765.33	2055.	0.113	346.4	579.0	59.98	12.87	24.39	442
32	797.42	2165.	0.108	360.8	603.2	60.75	12.83	24.03	451
33	829.07	2272.	0.104	375.1	627.1	61.48	12.80	23.73	460
34	860.34	2378.	0.100	389.2	650.7	62.19	12.76	23.47	469
35	891.29	2481.	0.096	403.1	674.1	62.86	12.74	23.24	477
36	921.96	2582.	0.093	417.0	697.2	63.52	12.72	23.05	485
37	952.38	2683.	0.090	430.7	720.2	64.14	12.70	22.88	493
38	982.59	2781.	0.087	444.3	743.0	64.75	12.68	22.73	501
39	1012.6	2879.	0.084	457.9	765.7	65.34	12.67	22.61	508
40	1042.4	2976.	0.081	471.3	788.2	65.91	12.66	22.49	515
41	1072.1	3072.	0.079	484.8	810.6	66.47	12.66	22.39	523
42	1101.7	3167.	0.077	498.1	833.0	67.01	12.66	22.30	530
43	1131.1	3261.	0.075	511.4	855.3	67.53	12.66	22.22	536
44	1160.4	3354.	0.073	524.7	877.4	68.04	12.66	22.15	543
45	1189.5	3447.	0.071	538.0	899.6	68.54	12.66	22.09	550
46	1218.6	3540.	0.069	551.2	921.6	69.02	12.67	22.04	556
47	1247.6	3631.	0.068	564.4	943.6	69.49	12.68	21.99	563
48	1276.5	3723.	0.066	577.6	965.6	69.96	12.69	21.96	569
49	1305.4	3814.	0.064	590.8	987.6	70.41	12.71	21.92	575
50	1334.1	3904.	0.063	603.9	1009.5	70.85	12.73	21.90	581
51	1362.8	3994.	0.062	617.1	1031.4	71.29	12.75	21.88	587
52	1391.5	4084.	0.060	630.3	1053.2	71.71	12.78	21.87	593
53	1420.0	4173.	0.059	643.5	1075.1	72.13	12.81	21.87	598
54	1448.6	4262.	0.058	656.7	1097.0	72.54	12.85	21.87	604
55	1477.0	4351.	0.057	669.9	1118.9	72.94	12.88	21.88	609
56	1505.5	4439.	0.056	683.1	1140.8	73.33	12.93	21.89	615
57	1533.9	4527.	0.055	696.4	1162.7	73.72	12.97	21.91	620
58	1562.2	4615.	0.054	709.7	1184.6	74.10	13.03	21.94	625
59	1590.5	4703.	0.053	723.1	1206.5	74.48	13.08	21.97	630
60	1618.8	4791.	0.052	736.5	1228.5	74.85	13.14	22.01	635
61	1647.0	4878.	0.051	749.9	1250.6	75.21	13.21	22.06	640
62	1675.2	4965.	0.050	763.4	1272.6	75.57	13.28	22.11	645
63	1703.4	5052.	0.049	777.0	1294.8	75.92	13.36	22.16	649
64	1731.5	5139.	0.048	790.7	1317.0	76.27	13.44	22.23	654
65	1759.6	5225.	0.047	804.4	1339.2	76.62	13.52	22.29	658
66	1787.7	5311.	0.047	818.2	1361.6	76.96	13.61	22.37	662
67	1815.7	5398.	0.046	832.0	1384.0	77.30	13.71	22.45	667
68	1843.8	5484.	0.045	846.0	1406.5	77.63	13.80	22.53	671
69	1871.8	5570.	0.045	860.1	1429.0	77.96	13.91	22.62	675
70	1899.8	5656.	0.044	874.2	1451.7	78.29	14.02	22.72	679
71	1927.7	5741.	0.043	888.5	1474.5	78.61	14.13	22.82	683
72	1955.7	5827.	0.043	902.9	1497.4	78.93	14.25	22.93	686
73	1983.6	5913.	0.042	917.4	1520.3	79.25	14.37	23.04	690
74	2011.5	5998.	0.041	932.0	1543.4	79.56	14.50	23.15	694
75	2039.4	6083.	0.041	946.7	1566.7	79.87	14.63	23.27	697
76	2067.3	6168.	0.040	961.6	1590.0	80.18	14.76	23.40	701
77	2095.2	6254.	0.040	976.6	1613.5	80.49	14.90	23.53	704
78	2123.0	6339.	0.039	991.7	1637.0	80.79	15.04	23.66	708
79	2150.9	6424.	0.039	1007.0	1660.8	81.09	15.19	23.80	711
80	2178.7	6508.	0.038	1022.4	1684.6	81.39	15.34	23.94	715
81	2206.5	6593.	0.038	1037.9	1708.7	81.69	15.49	24.08	718
82	2234.3	6678.	0.037	1053.6	1732.8	81.99	15.64	24.23	721
83	2262.1	6763.	0.037	1069.5	1757.1	82.28	15.80	24.38	724
84	2289.9	6847.	0.036	1085.5	1781.6	82.58	15.96	24.53	727
85	2317.6	6932.	0.036	1101.7	1806.2	82.87	16.12	24.69	730
86	2345.4	7016.	0.035	1118.0	1830.9	83.16	16.29	24.84	733
87	2373.1	7100.	0.035	1134.5	1855.9	83.44	16.45	25.00	736
88	2400.9	7185.	0.035	1151.1	1881.0	83.73	16.62	25.17	739
89	2428.6	7269.	0.034	1168.0	1906.2	84.02	16.79	25.33	742
90	2456.3	7353.	0.034	1185.0	1931.6	84.30	16.96	25.50	745
91	2484.0	7437.	0.033	1202.1	1957.2	84.58	17.14	25.66	748
92	2511.7	7522.	0.033	1219.4	1982.9	84.86	17.31	25.83	751
93	2539.4	7606.	0.033	1236.9	2008.9	85.14	17.48	26.00	754
94	2567.1	7690.	0.032	1254.6	2035.0	85.42	17.66	26.17	757
95	2594.8	7774.	0.032	1272.5	2061.2	85.70	17.83	26.34	760
96	2622.4	7858.	0.032	1290.5	2087.6	85.98	18.01	26.51	763
97	2650.1	7941.	0.031	1308.7	2114.2	86.25	18.18	26.68	765
98	2677.7	8025.	0.031	1327.0	2141.0	86.53	18.36	26.85	768
99	2705.4	8109.	0.031	1345.6	2167.9	86.80	18.53	27.02	771
100	2733.0	8193.	0.030	1364.3	2195.1	87.07	18.71	27.19	774

• TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

4.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME $CM^3/GMOLE$	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 13.937	26.10	23700.	9.416	-622.6	-612.0	10.02	9.55	13.15	1281
14	26.12	23538.	9.406	-621.8	-611.2	10.08	9.57	13.21	1278
15	26.40	22110.	9.231	-608.3	-597.6	11.02	9.90	13.99	1253
16	26.71	20668.	9.023	-593.9	-583.1	11.95	10.25	14.81	1225
17	27.03	19100.	8.845	-578.7	-567.8	12.88	10.60	15.75	1195
18	27.39	17693.	8.687	-562.6	-551.5	13.81	10.92	16.76	1168
19	27.77	16383.	8.522	-545.5	-534.3	14.75	11.22	17.80	1143
20	28.19	15140.	8.341	-527.3	-515.9	15.69	11.49	18.89	1119
21	28.65	13748.	8.150	-508.0	-496.4	16.64	11.72	20.16	1090
22	29.17	12449.	7.925	-487.4	-475.6	17.61	11.93	21.49	1062
23	29.75	10989.	7.663	-465.3	-453.3	18.60	12.10	23.11	1027
24	30.40	9623.	7.358	-441.6	-429.3	19.62	12.24	24.89	992
25	31.17	8219.	7.007	-416.0	-403.4	20.68	12.37	27.07	951
26	32.08	6812.	6.592	-387.9	-374.9	21.79	12.49	29.79	904
* 26.023	32.10	6787.	6.582	-387.3	-374.2	21.82	12.49	29.84	903
* 26.023	407.74	1147.	0.230	244.1	409.3	51.95	13.90	34.05	376
27	438.99	1315.	0.210	263.2	441.1	53.15	13.58	31.22	390
28	468.81	1470.	0.194	281.3	471.4	54.25	13.37	29.32	403
29	497.15	1613.	0.181	298.5	500.0	55.25	13.23	27.99	414
30	524.39	1748.	0.170	314.9	527.5	56.18	13.13	27.00	425
31	550.80	1876.	0.161	330.8	554.1	57.06	13.05	26.23	435
32	576.54	1999.	0.153	346.3	580.0	57.88	12.99	25.61	445
33	601.73	2117.	0.146	361.5	605.3	58.66	12.94	25.11	454
34	626.46	2232.	0.140	376.3	630.2	59.40	12.89	24.67	463
35	650.81	2344.	0.134	390.9	654.7	60.11	12.84	24.31	472
36	674.83	2453.	0.129	405.4	678.9	60.79	12.81	24.01	481
37	698.57	2561.	0.124	419.6	702.7	61.45	12.78	23.75	489
38	722.07	2666.	0.120	433.7	726.4	62.08	12.75	23.52	497
39	745.35	2770.	0.116	447.7	749.8	62.68	12.74	23.32	505
40	768.44	2872.	0.112	461.6	773.0	63.27	12.72	23.15	512
41	791.36	2973.	0.108	475.4	796.1	63.84	12.71	23.00	520
42	814.13	3072.	0.105	489.1	819.0	64.40	12.71	22.87	527
43	836.76	3171.	0.102	502.7	841.9	64.93	12.70	22.75	534
44	859.26	3269.	0.099	516.3	864.6	65.45	12.70	22.64	541
45	881.65	3366.	0.097	529.8	887.1	65.96	12.70	22.55	548
46	903.93	3462.	0.094	543.3	909.7	66.46	12.71	22.47	555
47	926.12	3557.	0.092	556.7	932.1	66.94	12.72	22.40	561
48	948.23	3651.	0.090	570.2	954.5	67.41	12.73	22.34	568
49	970.25	3745.	0.087	583.5	976.8	67.87	12.74	22.29	574
50	992.19	3839.	0.085	596.9	999.0	68.32	12.76	22.24	580
51	1014.1	3931.	0.084	610.3	1021.3	68.76	12.78	22.21	586
52	1035.9	4024.	0.082	623.6	1043.5	69.19	12.81	22.18	592
53	1057.6	4115.	0.080	637.0	1065.6	69.61	12.84	22.16	598
54	1079.3	4207.	0.078	650.3	1087.8	70.03	12.87	22.15	603
55	1101.0	4298.	0.077	663.7	1109.9	70.43	12.91	22.15	609
56	1122.6	4388.	0.075	677.1	1132.1	70.83	12.95	22.15	614
57	1144.1	4479.	0.074	690.5	1154.3	71.23	13.00	22.16	619
58	1165.6	4569.	0.072	704.0	1176.4	71.61	13.05	22.17	625
59	1187.1	4658.	0.071	717.5	1198.6	71.99	13.10	22.19	630
60	1208.5	4747.	0.070	731.0	1220.8	72.36	13.16	22.22	635
61	1229.9	4837.	0.068	744.6	1243.1	72.73	13.23	22.26	640
62	1251.3	4925.	0.067	758.2	1265.3	73.09	13.30	22.30	644
63	1272.6	5014.	0.066	771.9	1287.7	73.45	13.37	22.35	649
64	1293.9	5102.	0.065	785.6	1310.0	73.80	13.45	22.41	654
65	1315.2	5190.	0.064	799.4	1332.5	74.15	13.54	22.47	658
66	1336.4	5278.	0.063	813.3	1355.0	74.49	13.63	22.54	662
67	1357.7	5366.	0.062	827.3	1377.6	74.83	13.72	22.61	667
68	1378.9	5453.	0.061	841.4	1400.2	75.17	13.82	22.69	671
69	1400.0	5540.	0.060	855.5	1422.9	75.50	13.92	22.77	675
70	1421.2	5627.	0.059	869.8	1445.8	75.83	14.03	22.86	679
71	1442.3	5714.	0.058	884.1	1468.7	76.15	14.14	22.96	683
72	1463.4	5801.	0.057	898.6	1491.7	76.48	14.26	23.06	687
73	1484.5	5888.	0.056	913.1	1514.8	76.80	14.38	23.17	690
74	1505.6	5974.	0.056	927.8	1538.0	77.11	14.51	23.28	694
75	1526.7	6061.	0.055	942.6	1561.4	77.42	14.64	23.40	698
76	1547.7	6147.	0.054	957.5	1584.8	77.74	14.77	23.52	701
77	1568.7	6233.	0.053	972.6	1608.4	78.04	14.91	23.64	705
78	1589.8	6319.	0.053	987.8	1632.1	78.35	15.05	23.77	708
79	1610.8	6405.	0.052	1003.1	1655.9	78.65	15.20	23.90	712
80	1631.7	6491.	0.051	1018.6	1679.9	78.95	15.35	24.04	715
81	1652.7	6576.	0.050	1034.2	1704.0	79.25	15.50	24.18	718
82	1673.7	6662.	0.050	1049.9	1728.3	79.55	15.65	24.33	721
83	1694.6	6748.	0.049	1065.9	1752.7	79.85	15.81	24.47	725
84	1715.6	6833.	0.049	1081.9	1777.2	80.14	15.97	24.62	728
85	1736.5	6918.	0.048	1098.1	1801.9	80.43	16.13	24.78	731
86	1757.4	7004.	0.047	1114.5	1826.8	80.72	16.29	24.93	734
87	1778.3	7089.	0.047	1131.1	1851.8	81.01	16.46	25.09	737
88	1799.2	7174.	0.046	1147.8	1877.0	81.30	16.63	25.25	740
89	1820.1	7259.	0.046	1164.6	1902.3	81.59	16.80	25.41	743
90	1841.0	7344.	0.045	1181.7	1927.8	81.87	16.97	25.58	746
91	1861.8	7429.	0.045	1198.9	1953.5	82.16	17.14	25.74	749
92	1882.7	7513.	0.044	1216.2	1979.3	82.44	17.31	25.91	752
93	1903.5	7598.	0.044	1233.8	2005.3	82.72	17.49	26.08	755
94	1924.4	7683.	0.043	1251.5	2031.4	83.00	17.66	26.24	757
95	1945.2	7767.	0.043	1269.4	2057.8	83.28	17.84	26.41	760
96	1966.0	7852.	0.042	1287.4	2084.3	83.56	18.01	26.58	763
97	1986.9	7936.	0.042	1305.7	2110.9	83.83	18.19	26.75	766
98	2007.7	8021.	0.041	1324.1	2137.8	84.11	18.36	26.92	769
99	2028.5	8105.	0.041	1342.6	2164.8	84.38	18.54	27.09	772
100	2049.3	8189.	0.041	1361.4	2192.0	84.65	18.71	27.26	774

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

5.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 13.970	26.08	23791.	9.420	-622.5	-609.3	10.03	9.57	13.16	1282
14	26.09	23714.	9.416	-622.1	-608.9	10.06	9.58	13.19	1281
15	26.37	22298.	9.256	-608.7	-595.3	10.99	9.90	13.96	1257
16	26.67	20852.	9.049	-594.4	-580.9	11.92	10.25	14.78	1229
17	27.00	19314.	8.872	-579.3	-565.6	12.85	10.59	15.71	1200
18	27.35	17908.	8.713	-563.3	-549.4	13.77	10.92	16.70	1173
19	27.73	16595.	8.550	-546.3	-532.2	14.71	11.22	17.73	1148
20	28.14	15338.	8.370	-528.2	-513.9	15.64	11.48	18.81	1124
21	28.59	13970.	8.183	-509.0	-494.5	16.59	11.72	20.05	1096
22	29.10	12668.	7.959	-488.6	-473.8	17.55	11.92	21.36	1068
23	29.67	11236.	7.703	-466.7	-451.7	18.54	12.09	22.92	1035
24	30.31	9875.	7.405	-443.3	-427.9	19.55	12.24	24.64	1000
25	31.05	8484.	7.061	-418.0	-402.3	20.59	12.37	26.72	960
26	31.94	7091.	6.660	-390.4	-374.2	21.69	12.48	29.29	914
27	33.01	5663.	6.196	-359.8	-343.1	22.87	12.60	32.82	861
* 27.187	33.24	5361.	6.097	-353.7	-336.9	23.10	12.63	33.74	848
* 27.187	323.89	1043.	0.296	239.5	403.6	50.35	14.14	38.45	378
28	347.02	1204.	0.272	257.5	433.3	51.43	13.82	34.79	390
29	373.10	1379.	0.249	277.6	466.6	52.59	13.57	31.94	404
30	397.47	1538.	0.231	296.1	497.5	53.64	13.40	30.03	416
31	420.63	1685.	0.216	313.7	526.8	54.60	13.28	28.65	428
32	442.89	1824.	0.203	330.5	554.9	55.50	13.18	27.61	438
33	464.45	1956.	0.193	346.9	582.2	56.33	13.11	26.79	448
34	485.44	2087.	0.183	362.7	608.6	57.12	13.02	26.11	458
35	505.96	2203.	0.175	378.1	634.4	57.87	12.95	25.56	467
36	526.10	2327.	0.168	393.2	659.7	58.59	12.90	25.10	476
37	545.92	2437.	0.161	408.1	684.7	59.27	12.86	24.72	485
38	565.46	2549.	0.155	422.7	709.2	59.92	12.83	24.40	494
39	584.76	2659.	0.149	437.2	733.5	60.55	12.80	24.12	502
40	603.85	2767.	0.144	451.5	757.5	61.16	12.78	23.87	510
41	622.75	2873.	0.139	465.7	781.2	61.75	12.77	23.66	517
42	641.48	2978.	0.135	479.8	804.8	62.32	12.76	23.48	525
43	660.07	3081.	0.131	493.8	828.2	62.87	12.75	23.31	532
44	678.52	3183.	0.127	507.7	851.4	63.40	12.75	23.17	539
45	696.85	3284.	0.124	521.5	874.5	63.92	12.75	23.04	546
46	715.07	3384.	0.120	535.3	897.5	64.43	12.75	22.93	553
47	733.19	3482.	0.117	549.0	920.4	64.92	12.75	22.83	560
48	751.22	3580.	0.114	562.6	943.2	65.40	12.76	22.74	566
49	769.16	3677.	0.111	576.2	965.9	65.87	12.78	22.67	573
50	787.02	3774.	0.109	589.8	988.5	66.32	12.79	22.60	579
51	804.81	3869.	0.106	603.4	1011.1	66.77	12.81	22.55	585
52	822.54	3964.	0.104	616.9	1033.6	67.21	12.84	22.50	591
53	840.20	4059.	0.101	630.4	1056.1	67.64	12.87	22.47	597
54	857.81	4152.	0.099	644.0	1078.6	68.05	12.90	22.44	603
55	875.36	4246.	0.097	657.5	1101.0	68.47	12.93	22.42	608
56	892.86	4338.	0.095	671.1	1123.4	68.87	12.98	22.41	614
57	910.32	4431.	0.093	684.6	1145.8	69.27	13.02	22.40	619
58	927.73	4523.	0.091	698.2	1168.2	69.66	13.07	22.41	624
59	945.10	4614.	0.090	711.8	1190.6	70.04	13.12	22.42	629
60	962.43	4705.	0.088	725.5	1213.1	70.42	13.18	22.44	634
61	979.73	4796.	0.086	739.2	1235.5	70.79	13.25	22.47	639
62	996.99	4886.	0.085	752.9	1258.0	71.15	13.32	22.50	644
63	1014.2	4976.	0.083	766.7	1280.5	71.51	13.39	22.54	649
64	1031.4	5066.	0.082	780.6	1303.1	71.87	13.47	22.59	654
65	1048.6	5156.	0.080	794.5	1325.7	72.22	13.55	22.64	658
66	1065.7	5246.	0.079	808.5	1348.4	72.57	13.64	22.71	662
67	1082.9	5334.	0.078	822.5	1371.1	72.91	13.73	22.77	667
68	1100.0	5423.	0.077	836.7	1394.0	73.25	13.83	22.85	671
69	1117.0	5512.	0.075	850.9	1416.8	73.58	13.94	22.92	675
70	1134.1	5600.	0.074	865.3	1439.8	73.91	14.04	23.01	679
71	1151.1	5689.	0.073	879.7	1462.9	74.24	14.16	23.10	683
72	1168.1	5776.	0.072	894.2	1486.0	74.56	14.27	23.20	687
73	1185.1	5864.	0.071	908.9	1509.3	74.88	14.39	23.30	691
74	1202.1	5951.	0.070	923.6	1532.6	75.20	14.52	23.41	694
75	1219.0	6039.	0.069	938.5	1556.1	75.51	14.65	23.52	698
76	1236.0	6126.	0.068	953.5	1579.7	75.83	14.78	23.64	702
77	1252.9	6213.	0.067	968.6	1603.4	76.14	14.92	23.76	705
78	1269.8	6300.	0.066	983.9	1627.2	76.44	15.06	23.88	709
79	1286.7	6387.	0.065	999.2	1651.1	76.75	15.21	24.01	712
80	1303.6	6474.	0.064	1014.8	1675.2	77.05	15.35	24.15	715
81	1320.5	6560.	0.063	1030.4	1699.4	77.35	15.51	24.28	719
82	1337.3	6647.	0.063	1046.3	1723.8	77.65	15.66	24.43	722
83	1354.2	6733.	0.062	1062.2	1748.3	77.95	15.82	24.57	725
84	1371.0	6819.	0.061	1078.3	1772.9	78.24	15.98	24.72	728
85	1387.8	6905.	0.060	1094.6	1797.7	78.54	16.14	24.87	731
86	1404.6	6991.	0.060	1111.0	1822.7	78.83	16.30	25.02	734
87	1421.4	7077.	0.059	1127.6	1847.8	79.12	16.47	25.18	737
88	1438.2	7163.	0.058	1144.4	1873.0	79.41	16.64	25.34	740
89	1455.0	7249.	0.057	1161.3	1898.4	79.70	16.81	25.50	743
90	1471.8	7335.	0.057	1178.4	1924.0	79.98	16.98	25.66	746
91	1488.5	7420.	0.056	1195.6	1949.8	80.27	17.15	25.82	749
92	1505.3	7505.	0.055	1213.0	1975.7	80.55	17.32	25.98	752
93	1522.0	7591.	0.055	1230.6	2001.7	80.83	17.49	26.15	755
94	1538.8	7676.	0.054	1248.4	2028.0	81.11	17.67	26.32	758
95	1555.5	7761.	0.054	1266.3	2054.4	81.39	17.84	26.48	761
96	1572.2	7847.	0.053	1284.4	2080.9	81.67	18.02	26.65	764
97	1588.9	7932.	0.053	1302.7	2107.7	81.95	18.19	26.82	767
98	1605.7	8017.	0.052	1321.1	2134.6	82.22	18.37	26.99	769
99	1622.4	8102.	0.051	1339.7	2161.6	82.50	18.54	27.15	772
100	1639.1	8186.	0.051	1358.5	2188.9	82.77	18.72	27.32	775

* TWO-PHASE BOUNDARY

6.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_V, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 14.004	26.06	23884.	9.424	-622.4	-606.6	10.03	9.58	13.16	1284
15	26.34	22485.	9.280	-609.1	-593.1	10.96	9.91	13.94	1261
16	26.63	21057.	9.075	-595.0	-578.8	11.89	10.25	14.74	1234
17	26.96	19518.	8.896	-579.9	-563.5	12.81	10.59	15.66	1205
18	27.30	18121.	8.739	-563.9	-547.3	13.74	10.91	16.64	1179
19	27.68	16806.	8.577	-547.0	-530.2	14.67	11.21	17.67	1154
20	28.09	15537.	8.400	-529.0	-512.0	15.60	11.48	18.74	1129
21	28.54	14189.	8.213	-510.0	-492.6	16.54	11.71	19.95	1102
22	29.03	12887.	7.992	-489.7	-472.1	17.50	11.91	21.23	1074
23	29.59	11479.	7.743	-468.1	-450.1	18.48	12.09	22.74	1042
24	30.22	10125.	7.450	-444.9	-426.5	19.48	12.23	24.41	1008
25	30.94	8745.	7.114	-419.9	-401.1	20.51	12.36	26.40	969
26	31.79	7364.	6.726	-392.8	-373.5	21.60	12.47	28.83	925
27	32.83	5958.	6.282	-362.9	-342.9	22.75	12.59	32.12	874
28	34.14	4491.	5.757	-329.1	-308.3	24.01	12.74	37.13	811
* 28.198	34.44	4211.	5.640	-321.8	-300.8	24.28	12.77	38.37	798
* 28.198	265.73	929.8	0.370	232.3	393.8	48.92	14.40	44.12	378
29	287.03	1112.	0.336	252.5	427.0	50.08	14.05	38.59	392
30	310.62	1307.	0.305	274.5	463.4	51.32	13.76	34.57	406
31	332.28	1480.	0.281	294.6	496.6	52.41	13.56	32.01	419
32	352.64	1638.	0.261	313.3	527.6	53.39	13.41	30.23	431
33	372.06	1786.	0.245	331.1	557.3	54.30	13.30	28.91	442
34	390.75	1926.	0.232	348.1	585.6	55.15	13.17	27.86	452
35	408.87	2059.	0.220	364.5	613.0	55.95	13.08	27.04	462
36	426.53	2187.	0.210	380.4	639.7	56.70	13.01	26.38	472
37	443.82	2310.	0.201	396.0	665.8	57.41	12.95	25.83	481
38	460.79	2430.	0.193	411.3	691.4	58.10	12.91	25.38	490
39	477.48	2547.	0.185	426.3	716.6	58.75	12.87	25.00	499
40	493.95	2661.	0.178	441.2	741.5	59.38	12.85	24.67	507
41	510.20	2773.	0.172	455.8	766.0	59.98	12.82	24.38	515
42	526.28	2883.	0.166	470.3	790.2	60.57	12.81	24.13	523
43	542.19	2991.	0.161	484.6	814.3	61.13	12.80	23.92	530
44	557.96	3098.	0.156	498.9	838.1	61.68	12.79	23.73	537
45	573.60	3202.	0.152	513.0	861.7	62.21	12.79	23.56	545
46	589.12	3306.	0.147	527.1	885.2	62.73	12.79	23.41	552
47	604.54	3408.	0.143	541.0	908.6	63.23	12.79	23.28	558
48	619.86	3510.	0.140	554.9	931.8	63.72	12.80	23.16	565
49	635.09	3610.	0.136	568.8	954.9	64.20	12.81	23.06	572
50	650.24	3709.	0.133	582.6	977.9	64.66	12.82	22.97	578
51	665.31	3808.	0.129	596.4	1000.8	65.12	12.84	22.90	584
52	680.32	3905.	0.126	610.1	1023.7	65.56	12.87	22.83	590
53	695.26	4002.	0.123	623.8	1046.5	65.99	12.89	22.78	596
54	710.14	4098.	0.121	637.5	1069.3	66.42	12.92	22.74	602
55	724.97	4194.	0.118	651.2	1092.0	66.84	12.96	22.70	608
56	739.74	4289.	0.116	665.0	1114.7	67.25	13.00	22.67	613
57	754.47	4383.	0.113	678.7	1137.4	67.65	13.04	22.66	619
58	769.15	4477.	0.111	692.4	1160.0	68.04	13.09	22.65	624
59	783.79	4571.	0.109	706.2	1182.7	68.43	13.15	22.65	629
60	798.39	4664.	0.107	719.9	1205.3	68.81	13.20	22.66	634
61	812.96	4756.	0.105	733.8	1228.0	69.18	13.27	22.68	639
62	827.49	4848.	0.103	747.6	1250.7	69.55	13.33	22.70	644
63	841.99	4940.	0.101	761.5	1273.4	69.92	13.41	22.74	649
64	856.46	5031.	0.099	775.5	1296.2	70.27	13.49	22.78	654
65	870.89	5122.	0.097	789.5	1319.0	70.63	13.57	22.82	658
66	885.31	5213.	0.096	803.6	1341.8	70.98	13.66	22.88	663
67	899.69	5303.	0.094	817.8	1364.7	71.32	13.75	22.94	667
68	914.05	5394.	0.093	832.0	1387.7	71.66	13.85	23.00	671
69	928.39	5483.	0.091	846.3	1410.7	72.00	13.95	23.08	675
70	942.70	5573.	0.090	860.7	1433.9	72.33	14.06	23.16	679
71	957.00	5662.	0.088	875.3	1457.1	72.66	14.17	23.24	683
72	971.27	5752.	0.087	889.9	1480.4	72.99	14.28	23.34	687
73	985.53	5840.	0.086	904.6	1503.7	73.31	14.41	23.43	691
74	999.77	5929.	0.084	919.4	1527.2	73.63	14.53	23.54	695
75	1014.0	6018.	0.083	934.4	1550.8	73.94	14.66	23.64	698
76	1028.2	6106.	0.082	949.4	1574.5	74.26	14.79	23.76	702
77	1042.4	6194.	0.081	964.6	1598.3	74.57	14.93	23.87	706
78	1056.6	6282.	0.080	979.9	1622.3	74.88	15.07	24.00	709
79	1070.7	6370.	0.079	995.4	1646.3	75.19	15.22	24.12	712
80	1084.9	6457.	0.078	1011.0	1670.5	75.49	15.36	24.25	716
81	1099.0	6545.	0.077	1026.7	1694.8	75.79	15.51	24.39	719
82	1113.1	6632.	0.076	1042.6	1719.3	76.09	15.67	24.53	722
83	1127.2	6719.	0.075	1058.6	1743.9	76.39	15.82	24.67	726
84	1141.3	6806.	0.074	1074.8	1768.6	76.69	15.98	24.81	729
85	1155.4	6893.	0.073	1091.1	1793.5	76.98	16.15	24.96	732
86	1169.5	6980.	0.072	1107.6	1818.6	77.27	16.31	25.11	735
87	1183.5	7067.	0.071	1124.2	1843.7	77.56	16.47	25.26	738
88	1197.6	7153.	0.070	1141.0	1869.1	77.85	16.64	25.42	741
89	1211.6	7240.	0.069	1158.0	1894.6	78.14	16.81	25.58	744
90	1225.7	7326.	0.068	1175.1	1920.2	78.43	16.98	25.74	747
91	1239.7	7412.	0.068	1192.4	1946.1	78.71	17.15	25.90	750
92	1253.7	7498.	0.067	1209.8	1972.0	79.00	17.33	26.06	753
93	1267.7	7584.	0.066	1227.5	1998.2	79.28	17.50	26.22	756
94	1281.7	7670.	0.065	1245.3	2024.5	79.56	17.67	26.39	759
95	1295.7	7756.	0.065	1263.2	2051.0	79.84	17.85	26.55	762
96	1309.7	7842.	0.064	1281.4	2077.6	80.12	18.02	26.72	764
97	1323.7	7927.	0.063	1299.7	2104.4	80.40	18.20	26.88	767
98	1337.7	8013.	0.063	1318.1	2131.4	80.68	18.37	27.05	770
99	1351.6	8098.	0.062	1336.8	2158.5	80.95	18.55	27.22	773
100	1365.6	8184.	0.061	1355.6	2185.8	81.23	18.72	27.38	776

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

7.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
• 14.037	26.04	24015.	9.429	-622.4	-603.9	10.04	9.59	13.16	1287
15	26.31	22673.	9.300	-609.5	-590.9	10.93	9.91	13.92	1265
16	26.60	21239.	9.097	-595.4	-576.6	11.86	10.24	14.71	1238
17	26.92	19720.	8.921	-580.4	-561.3	12.78	10.58	15.62	1210
18	27.26	18332.	8.764	-564.5	-545.2	13.70	10.91	16.59	1184
19	27.63	17014.	8.604	-547.7	-528.1	14.63	11.20	17.60	1159
20	28.04	15737.	8.429	-529.9	-510.0	15.56	11.47	18.66	1134
21	28.48	14406.	8.243	-510.9	-490.7	16.49	11.70	19.84	1108
22	28.97	13104.	8.025	-490.8	-470.3	17.45	11.91	21.10	1080
23	29.51	11718.	7.782	-469.4	-448.4	18.42	12.08	22.57	1049
24	30.13	10370.	7.494	-446.5	-425.1	19.41	12.23	24.19	1015
25	30.84	9001.	7.165	-421.8	-399.9	20.44	12.36	26.09	977
26	31.66	7639.	6.790	-395.2	-372.7	21.50	12.47	28.40	935
27	32.65	6251.	6.359	-365.9	-342.7	22.64	12.58	31.45	886
28	33.88	4814.	5.858	-333.1	-309.0	23.86	12.72	35.94	827
29	35.54	3383.	5.269	-294.8	-269.6	25.24	12.88	43.35	756
• 29.097	35.74	3211.	5.203	-290.7	-265.3	25.39	12.90	44.67	747
• 29.097	222.51	809.0	0.453	222.4	380.2	47.59	14.71	51.79	378
30	245.59	1042.	0.400	248.5	422.7	49.03	14.24	42.34	395
31	267.27	1254.	0.360	272.5	462.1	50.32	13.92	37.04	410
32	286.87	1440.	0.330	294.0	497.4	51.44	13.70	33.84	423
33	305.14	1608.	0.306	313.8	530.2	52.45	13.53	31.65	435
34	322.42	1763.	0.287	332.3	561.0	53.37	13.35	30.03	446
35	338.99	1909.	0.270	350.0	590.4	54.22	13.22	28.82	457
36	355.01	2048.	0.256	366.9	618.7	55.02	13.12	27.87	468
37	370.57	2181.	0.244	383.4	646.2	55.77	13.04	27.11	477
38	385.77	2310.	0.233	399.4	673.0	56.49	12.99	26.49	487
39	400.66	2434.	0.224	415.1	699.2	57.17	12.94	25.98	496
40	415.28	2555.	0.215	430.4	725.0	57.82	12.91	25.54	504
41	429.68	2673.	0.207	445.6	750.3	58.45	12.88	25.17	512
42	443.88	2788.	0.200	460.5	775.3	59.05	12.86	24.85	520
43	457.91	2901.	0.193	475.3	800.1	59.63	12.84	24.57	528
44	471.78	3012.	0.187	489.9	824.5	60.19	12.83	24.32	536
45	485.51	3121.	0.181	504.3	848.7	60.74	12.83	24.11	543
46	499.12	3229.	0.176	518.7	872.7	61.26	12.83	23.92	550
47	512.62	3335.	0.171	533.0	896.6	61.78	12.83	23.75	557
48	526.01	3440.	0.166	547.1	920.2	62.28	12.83	23.60	564
49	539.31	3543.	0.161	561.2	943.8	62.76	12.84	23.47	570
50	552.53	3645.	0.157	575.3	967.2	63.23	12.86	23.36	577
51	565.67	3747.	0.153	589.3	990.5	63.70	12.87	23.26	583
52	578.74	3847.	0.150	603.2	1013.7	64.15	12.89	23.17	589
53	591.74	3947.	0.146	617.1	1036.8	64.59	12.92	23.10	596
54	604.68	4045.	0.143	631.0	1059.9	65.02	12.95	23.04	601
55	617.56	4143.	0.140	644.9	1082.9	65.44	12.98	22.99	607
56	630.39	4240.	0.137	658.8	1105.9	65.86	13.02	22.95	613
57	643.17	4337.	0.134	672.7	1128.9	66.26	13.07	22.92	618
58	655.90	4433.	0.131	686.6	1151.8	66.66	13.11	22.90	624
59	668.60	4528.	0.128	700.5	1174.7	67.05	13.17	22.89	629
60	681.25	4623.	0.126	714.4	1197.6	67.44	13.22	22.89	634
61	693.86	4717.	0.123	728.3	1220.4	67.81	13.29	22.89	639
62	706.44	4811.	0.121	742.3	1243.4	68.19	13.35	22.91	644
63	718.99	4904.	0.119	756.3	1266.3	68.55	13.43	22.93	649
64	731.51	4997.	0.117	770.4	1289.2	68.91	13.50	22.96	654
65	743.99	5090.	0.115	784.5	1312.2	69.27	13.58	23.00	658
66	756.45	5182.	0.113	798.7	1335.2	69.62	13.67	23.05	663
67	768.88	5274.	0.111	813.0	1358.3	69.97	13.76	23.10	667
68	781.29	5365.	0.109	827.3	1381.5	70.31	13.86	23.17	671
69	793.68	5456.	0.107	841.7	1404.7	70.65	13.96	23.23	675
70	806.04	5547.	0.105	856.2	1427.9	70.99	14.07	23.31	680
71	818.38	5637.	0.104	870.8	1451.3	71.32	14.18	23.39	684
72	830.70	5728.	0.102	885.5	1474.7	71.64	14.30	23.47	688
73	843.00	5818.	0.101	900.3	1498.2	71.97	14.42	23.57	691
74	855.29	5908.	0.099	915.2	1521.8	72.29	14.54	23.66	695
75	867.55	5997.	0.098	930.2	1545.6	72.61	14.67	23.77	699
76	879.80	6086.	0.096	945.4	1569.4	72.92	14.80	23.88	702
77	892.04	6175.	0.095	960.6	1593.3	73.24	14.94	23.99	706
78	904.26	6264.	0.094	976.0	1617.4	73.55	15.08	24.11	709
79	916.46	6353.	0.092	991.5	1641.5	73.86	15.22	24.23	713
80	928.65	6442.	0.091	1007.2	1665.8	74.16	15.37	24.36	716
81	940.83	6530.	0.090	1023.0	1690.3	74.46	15.52	24.49	720
82	952.99	6618.	0.089	1038.9	1714.8	74.77	15.68	24.63	723
83	965.15	6706.	0.087	1055.0	1739.5	75.07	15.83	24.77	726
84	977.29	6794.	0.086	1071.2	1764.4	75.36	15.99	24.91	729
85	989.42	6887.	0.085	1087.6	1789.3	75.66	16.15	25.05	732
86	1001.5	6969.	0.084	1104.1	1814.5	75.95	16.32	25.20	736
87	1013.6	7056.	0.083	1120.8	1839.7	76.24	16.48	25.35	739
88	1025.7	7144.	0.082	1137.6	1865.2	76.54	16.65	25.50	742
89	1037.8	7231.	0.081	1154.6	1890.8	76.82	16.82	25.66	745
90	1049.9	7318.	0.080	1171.8	1916.5	77.11	16.99	25.82	748
91	1062.0	7405.	0.079	1189.1	1942.4	77.40	17.16	25.98	751
92	1074.1	7491.	0.078	1206.6	1968.4	77.68	17.33	26.14	753
93	1086.1	7578.	0.077	1224.3	1994.7	77.97	17.51	26.30	756
94	1098.2	7665.	0.077	1242.2	2021.0	78.25	17.68	26.46	759
95	1110.2	7751.	0.076	1260.2	2047.6	78.53	17.85	26.62	762
96	1122.2	7837.	0.075	1278.3	2074.3	78.81	18.03	26.79	765
97	1134.3	7924.	0.074	1296.7	2101.2	79.09	18.20	26.95	768
98	1146.3	8010.	0.073	1315.2	2128.2	79.36	18.38	27.12	771
99	1158.3	8096.	0.072	1333.9	2155.4	79.64	18.55	27.28	774
100	1170.3	8182.	0.072	1352.7	2182.8	79.92	18.72	27.44	776

• TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

8.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME M^3 CM/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 14.071	26.02	24146.	9.433	-622.3	-601.2	10.04	9.61	13.16	1290
15	26.28	22859.	9.311	-609.9	-588.6	10.90	9.91	13.89	1269
16	26.57	21422.	9.120	-595.9	-574.3	11.83	10.24	14.69	1242
17	26.88	19921.	8.945	-581.0	-559.2	12.75	10.58	15.58	1214
18	27.22	18540.	8.789	-565.2	-543.1	13.67	10.90	16.53	1189
19	27.59	17222.	8.630	-548.4	-526.0	14.59	11.20	17.54	1164
20	27.99	15936.	8.457	-530.7	-508.0	15.51	11.46	18.59	1140
21	28.42	14622.	8.272	-511.9	-488.8	16.45	11.70	19.74	1114
22	28.90	13320.	8.059	-491.9	-468.5	17.39	11.90	20.98	1086
23	29.44	11954.	7.820	-470.7	-446.8	18.36	12.08	22.41	1056
24	30.04	10611.	7.537	-448.0	-423.6	19.34	12.23	23.98	1023
25	30.73	9258.	7.215	-423.7	-398.7	20.36	12.35	25.80	986
26	31.53	7903.	6.850	-397.4	-371.8	21.42	12.47	28.01	945
27	32.48	6532.	6.431	-368.7	-342.3	22.53	12.58	30.85	897
28	33.66	5124.	5.948	-336.7	-309.4	23.72	12.70	34.89	841
29	35.19	3730.	5.392	-300.1	-271.6	25.05	12.85	41.22	775
* 29.910	37.20	2387.	4.770	-259.5	-229.4	26.48	13.05	53.02	698
* 29.910	188.66	680.4	0.549	209.8	362.7	46.29	15.07	62.87	378
30	191.84	715.6	0.537	213.8	369.3	46.51	14.99	60.13	380
31	215.94	997.8	0.461	245.9	421.0	48.21	14.41	45.65	399
32	235.98	1223.	0.413	271.8	463.1	49.54	14.05	39.19	414
33	253.90	1418.	0.377	294.6	500.4	50.69	13.82	35.38	427
34	270.44	1593.	0.349	315.2	534.4	51.71	13.56	32.82	440
35	286.04	1754.	0.326	334.4	566.3	52.63	13.38	31.00	452
36	300.95	1906.	0.308	352.6	596.5	53.48	13.24	29.65	463
37	315.32	2050.	0.291	370.1	625.7	54.28	13.15	28.60	473
38	329.26	2187.	0.277	386.9	653.8	55.03	13.07	27.76	483
39	342.85	2319.	0.265	403.3	681.2	55.74	13.01	27.08	492
40	356.14	2447.	0.254	419.3	708.0	56.42	12.97	26.51	501
41	369.18	2572.	0.244	435.0	734.3	57.07	12.94	26.03	510
42	382.00	2693.	0.235	450.4	760.1	57.69	12.91	25.62	518
43	394.63	2811.	0.226	465.7	785.5	58.29	12.89	25.27	526
44	407.09	2927.	0.219	480.7	810.6	58.87	12.88	24.96	534
45	419.41	3040.	0.212	495.5	835.5	59.43	12.87	24.69	541
46	431.59	3152.	0.205	510.2	860.0	59.97	12.86	24.45	549
47	443.66	3262.	0.199	524.8	884.4	60.49	12.86	24.25	556
48	455.62	3370.	0.193	539.2	908.5	61.00	12.87	24.06	563
49	467.48	3477.	0.188	553.6	932.5	61.49	12.88	23.90	570
50	479.25	3582.	0.183	567.9	956.4	61.98	12.89	23.76	576
51	490.95	3687.	0.178	582.1	980.1	62.44	12.90	23.64	583
52	502.56	3790.	0.174	596.3	1003.6	62.90	12.92	23.53	589
53	514.11	3892.	0.170	610.4	1027.1	63.35	12.95	23.44	595
54	525.60	3993.	0.166	624.5	1050.5	63.79	12.98	23.36	601
55	537.03	4093.	0.162	638.5	1073.8	64.22	13.01	23.29	607
56	548.40	4192.	0.158	652.6	1097.1	64.63	13.05	23.23	613
57	559.72	4291.	0.155	666.6	1120.3	65.05	13.09	23.19	618
58	570.99	4389.	0.151	680.7	1143.5	65.45	13.14	23.15	624
59	582.22	4486.	0.148	694.7	1166.7	65.84	13.19	23.13	629
60	593.42	4583.	0.145	708.8	1189.8	66.23	13.24	23.12	634
61	604.57	4679.	0.143	722.8	1212.9	66.61	13.30	23.11	639
62	615.69	4774.	0.140	736.9	1236.0	66.99	13.37	23.12	644
63	626.77	4869.	0.137	751.1	1259.1	67.36	13.44	23.13	649
64	637.82	4964.	0.135	765.3	1282.3	67.73	13.52	23.16	654
65	648.84	5058.	0.132	779.5	1305.5	68.08	13.60	23.19	658
66	659.84	5151.	0.130	793.8	1328.7	68.44	13.69	23.23	663
67	670.81	5244.	0.128	808.2	1351.9	68.79	13.78	23.27	667
68	681.75	5337.	0.126	822.6	1375.2	69.13	13.88	23.33	672
69	692.67	5429.	0.123	837.1	1398.6	69.47	13.98	23.39	676
70	703.57	5522.	0.121	851.7	1422.0	69.81	14.08	23.46	680
71	714.44	5613.	0.119	866.4	1445.5	70.15	14.19	23.53	684
72	725.30	5705.	0.118	881.1	1469.1	70.47	14.31	23.61	688
73	736.13	5796.	0.116	896.0	1492.7	70.80	14.43	23.70	692
74	746.95	5887.	0.114	911.0	1516.5	71.12	14.55	23.79	696
75	757.75	5977.	0.112	926.1	1540.3	71.44	14.68	23.89	699
76	768.53	6067.	0.111	941.3	1564.3	71.76	14.81	24.00	703
77	779.30	6158.	0.109	956.6	1588.3	72.08	14.95	24.11	706
78	790.06	6247.	0.108	972.1	1612.5	72.39	15.09	24.22	710
79	800.79	6337.	0.106	987.6	1636.8	72.70	15.23	24.34	713
80	811.52	6426.	0.105	1003.4	1661.2	73.00	15.38	24.47	717
81	822.23	6516.	0.103	1019.2	1685.7	73.31	15.53	24.59	720
82	832.93	6605.	0.102	1035.2	1710.4	73.61	15.68	24.73	723
83	843.62	6693.	0.100	1051.3	1735.2	73.91	15.84	24.86	727
84	854.29	6782.	0.099	1067.6	1760.1	74.21	16.00	25.00	730
85	864.95	6870.	0.098	1084.0	1785.2	74.51	16.16	25.14	733
86	875.61	6958.	0.097	1100.6	1810.4	74.80	16.32	25.29	736
87	886.25	7047.	0.095	1117.4	1835.8	75.10	16.49	25.44	739
88	896.88	7135.	0.094	1134.3	1861.3	75.39	16.66	25.59	742
89	907.51	7223.	0.093	1151.3	1886.9	75.68	16.83	25.74	745
90	918.12	7310.	0.092	1168.5	1912.8	75.97	17.00	25.90	748
91	928.73	7398.	0.091	1185.9	1938.7	76.25	17.17	26.05	751
92	939.32	7485.	0.090	1203.5	1964.9	76.54	17.34	26.21	754
93	949.91	7572.	0.089	1221.2	1991.2	76.82	17.51	26.37	757
94	960.49	7660.	0.088	1239.0	2017.6	77.11	17.69	26.53	760
95	971.07	7747.	0.087	1257.1	2044.2	77.39	17.86	26.69	763
96	981.63	7834.	0.086	1275.3	2071.0	77.67	18.03	26.86	766
97	992.19	7920.	0.085	1293.7	2097.9	77.95	18.21	27.02	769
98	1002.7	8007.	0.084	1312.2	2125.0	78.22	18.38	27.18	771
99	1013.3	8094.	0.083	1330.9	2152.3	78.50	18.56	27.34	774
100	1023.8	8180.	0.082	1349.8	2179.7	78.78	18.73	27.51	777

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

9.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME $CM^3/GMOLE$	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 14.104	26.00	24277.	9.438	-622.2	-598.5	10.04	9.62	13.16	1292
15	26.25	23044.	9.323	-610.3	-586.4	10.88	9.91	13.86	1273
16	26.53	21604.	9.142	-596.3	-572.1	11.80	10.24	14.66	1247
17	26.85	20120.	8.969	-581.5	-557.0	12.71	10.58	15.54	1219
18	27.18	18747.	8.814	-565.8	-541.0	13.63	10.90	16.48	1194
19	27.55	17427.	8.657	-549.1	-524.0	14.55	11.19	17.47	1169
20	27.94	16134.	8.485	-531.5	-506.0	15.47	11.46	18.52	1145
21	28.37	14836.	8.301	-512.8	-486.9	16.40	11.69	19.65	1119
22	28.84	13534.	8.091	-493.0	-466.7	17.34	11.90	20.87	1092
23	29.37	12188.	7.856	-471.9	-445.1	18.30	12.07	22.25	1063
24	29.96	10849.	7.579	-449.4	-422.1	19.28	12.22	23.78	1030
25	30.63	9506.	7.264	-425.4	-397.5	20.29	12.35	25.54	994
26	31.41	8163.	6.908	-399.5	-370.9	21.33	12.46	27.65	954
27	32.32	6807.	6.500	-371.3	-341.8	22.43	12.57	30.31	908
28	33.44	5426.	6.033	-340.2	-309.7	23.59	12.69	33.97	854
29	34.87	4064.	5.504	-304.9	-273.1	24.88	12.83	39.47	793
30	36.89	2647.	4.865	-262.6	-229.0	26.37	13.02	49.99	715
* 30.651	38.88	1687.	4.337	-227.8	-192.3	27.58	13.22	65.56	648
* 30.651	161.07	543.4	0.662	193.9	340.8	44.98	15.51	80.41	376
31	171.69	683.4	0.609	210.6	367.1	45.84	15.15	65.33	385
32	194.27	978.9	0.519	245.2	422.4	47.59	14.53	48.17	404
33	212.79	1213.	0.462	272.7	466.7	48.96	14.17	40.80	419
34	229.18	1413.	0.421	296.2	505.2	50.11	13.80	36.53	434
35	244.28	1593.	0.390	317.5	540.3	51.12	13.55	33.76	447
36	258.49	1760.	0.365	337.3	573.0	52.04	13.38	31.80	458
37	272.04	1915.	0.343	356.0	604.0	52.90	13.25	30.35	469
38	285.08	2063.	0.325	373.8	633.8	53.69	13.16	29.22	480
39	297.71	2204.	0.310	391.1	662.5	54.44	13.09	28.32	489
40	310.00	2339.	0.296	407.8	690.5	55.14	13.04	27.58	499
41	322.01	2470.	0.283	424.1	717.8	55.82	12.99	26.97	508
42	333.78	2597.	0.272	440.1	744.5	56.46	12.96	26.46	516
43	345.35	2721.	0.262	455.8	770.7	57.08	12.94	26.02	524
44	356.74	2842.	0.252	471.2	796.5	57.67	12.92	25.64	532
45	367.96	2960.	0.244	486.5	822.0	58.24	12.91	25.31	540
46	379.05	3076.	0.236	501.5	847.2	58.80	12.90	25.02	548
47	390.01	3189.	0.229	516.4	872.1	59.33	12.90	24.77	555
48	400.86	3301.	0.222	531.2	896.7	59.85	12.90	24.55	562
49	411.61	3411.	0.215	545.8	921.2	60.36	12.91	24.35	569
50	422.26	3520.	0.209	560.4	945.4	60.85	12.92	24.18	575
51	432.83	3627.	0.204	574.8	969.5	61.32	12.93	24.03	582
52	443.33	3733.	0.199	589.2	993.5	61.79	12.95	23.89	588
53	453.75	3838.	0.194	603.6	1017.3	62.24	12.98	23.78	595
54	464.11	3941.	0.189	617.8	1041.1	62.69	13.00	23.68	601
55	474.41	4044.	0.185	632.1	1064.7	63.12	13.04	23.59	607
56	484.64	4145.	0.180	646.3	1088.3	63.54	13.07	23.52	612
57	494.83	4246.	0.176	660.5	1111.8	63.96	13.11	23.46	618
58	504.97	4346.	0.172	674.7	1135.2	64.37	13.16	23.41	623
59	515.07	4445.	0.169	688.9	1158.6	64.77	13.21	23.38	629
60	525.12	4543.	0.165	703.1	1182.0	65.16	13.26	23.35	634
61	535.14	4641.	0.162	717.3	1205.3	65.55	13.32	23.34	639
62	545.12	4738.	0.159	731.5	1228.7	65.93	13.39	23.33	644
63	555.07	4835.	0.156	745.8	1252.0	66.30	13.46	23.34	649
64	564.98	4931.	0.153	760.1	1275.3	66.67	13.54	23.35	654
65	574.86	5026.	0.150	774.5	1298.7	67.03	13.62	23.37	659
66	584.72	5121.	0.147	788.9	1322.1	67.39	13.70	23.40	663
67	594.55	5216.	0.145	803.3	1345.5	67.74	13.79	23.44	668
68	604.35	5310.	0.142	817.9	1369.0	68.09	13.89	23.49	672
69	614.13	5404.	0.140	832.5	1392.5	68.43	13.99	23.55	676
70	623.89	5497.	0.138	847.1	1416.1	68.77	14.10	23.61	680
71	633.62	5590.	0.135	861.9	1439.7	69.10	14.21	23.68	684
72	643.34	5682.	0.133	876.8	1463.4	69.44	14.32	23.75	688
73	653.04	5774.	0.131	891.7	1487.2	69.76	14.44	23.84	692
74	662.71	5866.	0.129	906.8	1511.1	70.09	14.56	23.93	696
75	672.37	5958.	0.127	921.9	1535.1	70.41	14.69	24.02	700
76	682.02	6049.	0.125	937.2	1559.2	70.73	14.82	24.12	703
77	691.64	6140.	0.123	952.6	1583.3	71.05	14.96	24.23	707
78	701.26	6231.	0.122	968.1	1607.6	71.36	15.10	24.34	710
79	710.85	6322.	0.120	983.8	1632.0	71.67	15.24	24.45	714
80	720.44	6412.	0.118	999.5	1656.5	71.98	15.39	24.57	717
81	730.01	6502.	0.117	1015.5	1681.2	72.28	15.54	24.70	721
82	739.57	6592.	0.115	1031.5	1705.9	72.59	15.69	24.83	724
83	749.11	6681.	0.114	1047.7	1730.8	72.89	15.85	24.96	727
84	758.65	6771.	0.112	1064.0	1755.9	73.19	16.01	25.10	730
85	768.17	6860.	0.111	1080.5	1781.0	73.49	16.17	25.24	734
86	777.68	6949.	0.109	1097.1	1806.3	73.78	16.33	25.38	737
87	787.18	7038.	0.108	1113.9	1831.8	74.08	16.50	25.53	740
88	796.68	7126.	0.107	1130.9	1857.4	74.37	16.66	25.67	743
89	806.16	7215.	0.105	1148.0	1883.1	74.66	16.83	25.82	746
90	815.63	7303.	0.104	1165.2	1909.0	74.95	17.00	25.98	749
91	825.10	7391.	0.103	1182.7	1935.1	75.24	17.17	26.13	752
92	834.55	7479.	0.102	1200.3	1961.3	75.53	17.34	26.29	755
93	844.00	7567.	0.100	1218.0	1987.7	75.81	17.52	26.45	758
94	853.44	7655.	0.099	1235.9	2014.2	76.09	17.69	26.60	761
95	862.87	7743.	0.098	1254.0	2040.9	76.38	17.87	26.76	764
96	872.30	7830.	0.097	1272.3	2067.7	76.66	18.04	26.92	766
97	881.72	7918.	0.096	1290.7	2094.7	76.94	18.21	27.09	769
98	891.13	8005.	0.095	1309.3	2121.9	77.22	18.39	27.25	772
99	900.54	8092.	0.094	1328.0	2149.2	77.49	18.56	27.41	775
100	909.93	8179.	0.093	1346.9	2176.7	77.77	18.73	27.57	778

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

10.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY, J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
• 14.137	25.98	24408.	9.442	-622.1	-595.8	10.05	9.63	13.16	1295
15	26.22	23229.	9.334	-610.7	-584.2	10.85	9.91	13.83	1276
16	26.50	21785.	9.163	-596.8	-569.9	11.77	10.24	14.63	1251
17	26.81	20318.	8.993	-582.0	-554.8	12.68	10.57	15.50	1224
18	27.14	18952.	8.838	-566.4	-538.8	13.60	10.89	16.43	1199
19	27.50	17631.	8.683	-549.8	-521.9	14.51	11.19	17.41	1174
20	27.89	16332.	8.513	-532.2	-504.0	15.43	11.45	18.45	1150
21	28.32	15048.	8.330	-513.7	-485.0	16.36	11.69	19.55	1125
22	28.78	13747.	8.124	-494.0	-464.9	17.29	11.89	20.76	1098
23	29.30	12418.	7.891	-473.1	-443.4	18.25	12.07	22.10	1069
24	29.88	11085.	7.620	-450.9	-420.6	19.22	12.22	23.59	1037
25	30.53	9752.	7.311	-427.1	-396.2	20.21	12.35	25.29	1002
26	31.29	8418.	6.965	-401.6	-369.8	21.25	12.46	27.32	963
27	32.17	7082.	6.567	-373.9	-341.3	22.32	12.57	29.81	919
28	33.24	5724.	6.117	-343.5	-309.8	23.47	12.68	33.17	868
29	34.59	4384.	5.607	-309.3	-274.2	24.72	12.81	38.02	809
30	36.41	3016.	5.010	-269.3	-232.4	26.13	12.97	46.51	737
31	39.31	1613.	4.243	-217.8	-177.9	27.92	13.26	67.43	642
• 31.335	40.93	1109.	3.894	-194.1	-152.6	28.73	13.45	86.20	598
• 31.335	137.49	405.2	0.796	173.6	312.9	43.59	16.05	109.86	373
32	157.42	686.8	0.669	210.4	369.9	45.40	15.24	67.64	391
33	178.23	985.4	0.569	246.7	427.3	47.16	14.63	49.55	410
34	195.19	1221.	0.508	274.8	472.6	48.52	14.10	41.78	426
35	210.23	1425.	0.463	298.9	512.0	49.66	13.76	37.36	441
36	224.08	1608.	0.429	320.7	547.8	50.67	13.53	34.47	454
37	237.10	1778.	0.401	341.0	581.2	51.58	13.37	32.43	466
38	249.50	1936.	0.378	360.0	612.8	52.43	13.25	30.91	476
39	261.42	2087.	0.358	378.2	643.1	53.21	13.17	29.73	487
40	272.96	2230.	0.340	395.8	672.4	53.95	13.10	28.79	496
41	284.18	2368.	0.325	412.8	700.8	54.65	13.05	28.02	505
42	295.14	2502.	0.311	429.4	728.5	55.32	13.01	27.37	514
43	305.87	2631.	0.299	445.6	755.6	55.96	12.99	26.83	523
44	316.41	2757.	0.288	461.5	782.1	56.57	12.96	26.37	531
45	326.78	2880.	0.278	477.2	808.3	57.16	12.95	25.97	539
46	337.00	3000.	0.268	492.6	834.1	57.73	12.94	25.62	546
47	347.08	3118.	0.259	507.9	859.6	58.27	12.94	25.32	554
48	357.05	3233.	0.251	523.0	884.8	58.80	12.94	25.05	561
49	366.91	3347.	0.244	537.9	909.7	59.32	12.94	24.82	568
50	376.68	3458.	0.237	552.7	934.4	59.82	12.95	24.61	575
51	386.35	3569.	0.230	567.5	958.9	60.30	12.96	24.43	581
52	395.95	3677.	0.224	582.1	983.3	60.78	12.98	24.27	588
53	405.47	3785.	0.218	596.6	1007.5	61.24	13.00	24.13	594
54	414.93	3891.	0.213	611.1	1031.6	61.69	13.03	24.01	600
55	424.32	3996.	0.208	625.6	1055.5	62.13	13.06	23.91	606
56	433.66	4099.	0.203	640.0	1079.4	62.56	13.10	23.81	612
57	442.94	4202.	0.198	654.4	1103.2	62.98	13.13	23.74	618
58	452.17	4304.	0.194	668.7	1126.9	63.39	13.18	23.67	623
59	461.36	4405.	0.190	683.1	1150.6	63.79	13.23	23.63	629
60	470.51	4505.	0.186	697.4	1174.2	64.19	13.28	23.59	634
61	479.62	4605.	0.182	711.8	1197.7	64.58	13.34	23.56	639
62	488.69	4703.	0.178	726.1	1221.3	64.96	13.41	23.55	644
63	497.73	4801.	0.175	740.5	1244.8	65.34	13.48	23.54	649
64	506.73	4899.	0.171	754.9	1268.4	65.71	13.55	23.55	654
65	515.70	4996.	0.168	769.4	1291.9	66.08	13.63	23.56	659
66	524.65	5093.	0.165	783.9	1315.5	66.44	13.72	23.58	663
67	533.56	5188.	0.162	798.5	1339.1	66.79	13.81	23.62	668
68	542.46	5283.	0.159	813.1	1362.8	67.14	13.90	23.66	672
69	551.32	5378.	0.157	827.8	1386.4	67.49	14.00	23.71	676
70	560.17	5473.	0.154	842.6	1410.2	67.83	14.11	23.76	681
71	568.99	5567.	0.152	857.4	1434.0	68.17	14.22	23.83	685
72	577.80	5661.	0.149	872.4	1457.8	68.50	14.33	23.90	689
73	586.58	5754.	0.147	887.4	1481.8	68.83	14.45	23.97	693
74	595.35	5847.	0.144	902.5	1505.8	69.16	14.57	24.06	696
75	604.09	5939.	0.142	917.8	1529.9	69.48	14.70	24.15	700
76	612.82	6032.	0.140	933.1	1554.1	69.80	14.83	24.24	704
77	621.54	6124.	0.138	948.6	1578.4	70.12	14.97	24.34	707
78	630.24	6216.	0.136	964.2	1602.8	70.43	15.11	24.45	711
79	638.92	6307.	0.134	979.9	1627.3	70.75	15.25	24.56	714
80	647.59	6398.	0.132	995.7	1651.9	71.06	15.40	24.68	718
81	656.25	6489.	0.130	1011.7	1676.6	71.36	15.55	24.80	721
82	664.90	6579.	0.129	1027.8	1701.5	71.67	15.70	24.93	725
83	673.53	6670.	0.127	1044.1	1726.5	71.97	15.86	25.06	728
84	682.15	6760.	0.125	1060.4	1751.6	72.27	16.01	25.19	731
85	690.76	6850.	0.124	1077.0	1776.9	72.57	16.18	25.33	734
86	699.36	6940.	0.122	1093.7	1802.3	72.87	16.34	25.47	737
87	707.95	7029.	0.120	1110.5	1827.8	73.16	16.50	25.61	740
88	716.53	7118.	0.119	1127.5	1853.5	73.46	16.67	25.76	744
89	725.10	7208.	0.117	1144.7	1879.4	73.75	16.84	25.91	747
90	733.66	7297.	0.116	1162.0	1905.3	74.04	17.01	26.06	750
91	742.21	7385.	0.115	1179.4	1931.5	74.33	17.18	26.21	753
92	750.75	7474.	0.113	1197.1	1957.8	74.62	17.35	26.36	756
93	759.29	7563.	0.112	1214.9	1984.2	74.90	17.52	26.52	758
94	767.82	7651.	0.111	1232.8	2010.8	75.19	17.70	26.68	761
95	776.34	7739.	0.109	1250.9	2037.6	75.47	17.87	26.83	764
96	784.85	7827.	0.108	1269.2	2064.5	75.75	18.04	26.99	767
97	793.35	7915.	0.107	1287.7	2091.6	76.03	18.22	27.15	770
98	801.85	8003.	0.106	1306.3	2118.8	76.31	18.39	27.31	773
99	810.35	8091.	0.105	1325.1	2146.2	76.59	18.57	27.47	776
100	818.83	8178.	0.103	1344.1	2173.7	76.87	18.74	27.63	779

• TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

12.5 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3 ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
• 14.220	25.94	24716.	9.447	-621.9	-589.0	10.06	9.66	13.16	1301
15	26.14	23688.	9.361	-611.7	-578.6	10.78	9.91	13.75	1285
16	26.42	22235.	9.217	-597.9	-564.4	11.69	10.24	14.56	1261
17	26.73	20806.	9.052	-583.2	-549.4	12.60	10.57	15.41	1235
18	27.05	19455.	8.899	-567.8	-533.5	13.51	10.88	16.31	1211
19	27.40	18135.	8.746	-551.4	-516.7	14.42	11.18	17.27	1187
20	27.78	16819.	8.581	-534.1	-499.0	15.33	11.44	18.28	1162
21	28.19	15570.	8.400	-515.9	-480.2	16.25	11.67	19.33	1138
22	28.63	14277.	8.202	-496.5	-460.3	17.17	11.88	20.50	1112
23	29.13	12980.	7.975	-476.0	-439.1	18.11	12.06	21.75	1085
24	29.68	11663.	7.718	-454.3	-416.7	19.07	12.21	23.15	1054
25	30.30	10354.	7.425	-431.2	-392.8	20.04	12.34	24.72	1021
26	31.01	9044.	7.095	-406.4	-367.1	21.05	12.45	26.55	984
27	31.83	7737.	6.724	-379.8	-339.5	22.09	12.55	28.75	944
28	32.79	6429.	6.312	-350.9	-309.3	23.19	12.66	31.56	898
29	33.97	5144.	5.845	-319.0	-276.0	24.36	12.77	35.29	845
30	35.47	3860.	5.319	-283.0	-238.1	25.64	12.90	40.93	785
31	37.56	2596.	4.700	-240.4	-192.8	27.13	13.08	50.80	712
32	41.02	1317.	3.902	-184.2	-132.2	29.05	13.42	76.51	614
• 32.836	52.53	66.57	2.332	-72.9	-6.4	32.92	16.54	766.30	394
• 32.836	81.91	39.36	1.479	67.2	171.0	38.32	18.90	1259.25	363
33	97.38	201.1	1.195	119.6	243.0	40.51	17.52	242.84	374
34	127.57	661.6	0.849	200.2	361.8	44.07	15.35	76.37	407
35	145.57	959.8	0.714	241.2	425.6	45.92	14.48	54.42	426
36	160.07	1206.	0.634	272.1	474.9	47.30	14.01	45.16	442
37	172.82	1420.	0.577	298.3	517.2	48.47	13.71	39.98	456
38	184.49	1612.	0.533	321.7	555.4	49.48	13.51	36.62	469
39	195.42	1790.	0.498	343.3	590.8	50.40	13.37	34.26	480
40	205.78	1958.	0.468	363.5	624.1	51.25	13.27	32.50	491
41	215.72	2114.	0.443	382.7	655.9	52.03	13.20	31.14	501
42	225.31	2264.	0.421	401.2	686.5	52.77	13.14	30.06	510
43	234.62	2409.	0.402	419.0	716.1	53.47	13.10	29.17	519
44	243.69	2548.	0.385	436.3	744.9	54.13	13.07	28.43	528
45	252.55	2683.	0.369	453.2	773.0	54.76	13.05	27.81	536
46	261.24	2814.	0.355	469.7	800.6	55.37	13.03	27.28	544
47	269.78	2942.	0.342	485.9	827.6	55.95	13.02	26.82	552
48	278.19	3067.	0.331	501.9	854.2	56.51	13.02	26.43	559
49	286.47	3189.	0.320	517.7	880.5	57.05	13.02	26.08	567
50	294.65	3309.	0.310	533.2	906.4	57.57	13.03	25.78	574
51	302.73	3426.	0.300	548.6	932.1	58.08	13.04	25.51	581
52	310.72	3542.	0.292	563.9	957.5	58.57	13.05	25.27	587
53	318.63	3656.	0.284	579.1	982.6	59.05	13.07	25.07	594
54	326.47	3768.	0.276	594.1	1007.6	59.52	13.09	24.89	600
55	334.25	3879.	0.269	609.1	1032.4	59.97	13.12	24.73	606
56	341.96	3988.	0.262	624.0	1057.1	60.42	13.16	24.58	612
57	349.61	4096.	0.256	638.8	1081.7	60.85	13.19	24.46	618
58	357.22	4203.	0.250	653.6	1106.1	61.28	13.23	24.36	624
59	364.78	4308.	0.244	668.4	1130.4	61.69	13.28	24.27	629
60	372.29	4413.	0.239	683.1	1154.6	62.10	13.33	24.20	635
61	379.76	4517.	0.233	697.8	1178.8	62.50	13.39	24.14	640
62	387.20	4620.	0.229	712.5	1202.9	62.89	13.45	24.10	645
63	394.60	4722.	0.224	727.2	1227.0	63.28	13.52	24.07	650
64	401.96	4823.	0.219	741.9	1251.0	63.66	13.59	24.05	655
65	409.30	4923.	0.215	756.7	1275.1	64.03	13.67	24.04	660
66	416.60	5023.	0.211	771.5	1299.1	64.40	13.76	24.04	664
67	423.88	5123.	0.207	786.3	1323.2	64.76	13.84	24.05	669
68	431.13	5221.	0.203	801.2	1347.2	65.12	13.94	24.08	673
69	438.35	5319.	0.200	816.1	1371.3	65.47	14.04	24.11	678
70	445.56	5416.	0.196	831.1	1395.5	65.81	14.14	24.15	682
71	452.74	5513.	0.193	846.2	1419.6	66.16	14.25	24.20	686
72	459.90	5610.	0.190	861.4	1443.9	66.50	14.36	24.25	690
73	467.04	5706.	0.187	876.6	1468.2	66.83	14.48	24.32	694
74	474.16	5801.	0.184	892.0	1492.5	67.16	14.60	24.39	698
75	481.26	5896.	0.181	907.4	1516.9	67.49	14.73	24.47	702
76	488.35	5991.	0.178	922.9	1541.4	67.82	14.86	24.55	705
77	495.42	6085.	0.175	938.6	1566.0	68.14	14.99	24.64	709
78	502.48	6179.	0.172	954.3	1590.7	68.46	15.13	24.74	713
79	509.52	6272.	0.170	970.2	1615.5	68.77	15.27	24.84	716
80	516.54	6366.	0.167	986.2	1640.4	69.08	15.42	24.95	719
81	523.56	6459.	0.165	1002.3	1665.4	69.40	15.57	25.06	723
82	530.56	6551.	0.163	1018.6	1690.6	69.70	15.72	25.18	726
83	537.55	6644.	0.161	1035.0	1715.8	70.01	15.88	25.30	730
84	544.53	6736.	0.158	1051.5	1741.2	70.31	16.03	25.43	733
85	551.49	6827.	0.156	1068.2	1766.7	70.62	16.19	25.56	736
86	558.45	6919.	0.154	1085.0	1792.3	70.91	16.36	25.69	739
87	565.39	7010.	0.152	1102.0	1818.1	71.21	16.52	25.83	742
88	572.33	7101.	0.150	1119.1	1844.0	71.51	16.69	25.97	745
89	579.25	7192.	0.148	1136.3	1870.0	71.80	16.85	26.11	748
90	586.17	7283.	0.146	1153.8	1896.2	72.10	17.02	26.26	751
91	593.08	7373.	0.145	1171.3	1922.5	72.39	17.19	26.40	754
92	599.97	7463.	0.143	1189.1	1949.0	72.68	17.37	26.55	757
93	606.87	7553.	0.141	1207.0	1975.6	72.96	17.54	26.70	760
94	613.75	7643.	0.140	1225.1	2002.4	73.25	17.71	26.86	763
95	620.62	7733.	0.138	1243.3	2029.3	73.54	17.88	27.01	766
96	627.49	7822.	0.136	1261.7	2056.4	73.82	18.06	27.16	769
97	634.35	7911.	0.135	1280.2	2083.7	74.10	18.23	27.32	772
98	641.21	8000.	0.133	1298.9	2111.1	74.38	18.41	27.47	775
99	648.06	8089.	0.132	1317.8	2138.6	74.66	18.58	27.63	778
100	654.90	8178.	0.130	1336.9	2166.3	74.94	18.75	27.79	780

• TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

15.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME $CM^3/GMOLE$	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
• 14.302	25.89	25048.	9.452	-621.7	-582.3	10.07	9.69	13.16	1307
15	26.07	24143.	9.387	-612.6	-573.0	10.71	9.91	13.68	1294
16	26.35	22681.	9.270	-598.9	-558.9	11.62	10.24	14.50	1271
17	26.64	21292.	9.108	-584.5	-544.0	12.52	10.56	15.32	1246
18	26.96	19952.	8.955	-569.2	-528.2	13.43	10.87	16.20	1222
19	27.30	18632.	8.806	-553.0	-511.5	14.33	11.16	17.13	1199
20	27.66	17311.	8.645	-535.9	-493.9	15.23	11.43	18.12	1175
21	28.06	16083.	8.468	-517.9	-475.3	16.14	11.66	19.13	1152
22	28.49	14788.	8.276	-498.9	-455.6	17.06	11.87	20.25	1126
23	28.97	13531.	8.056	-478.8	-434.8	17.98	12.05	21.43	1100
24	29.50	12225.	7.811	-457.5	-412.7	18.92	12.20	22.76	1071
25	30.09	10936.	7.530	-434.9	-389.2	19.88	12.33	24.22	1039
26	30.75	9648.	7.215	-410.9	-364.1	20.86	12.45	25.89	1004
27	31.51	8369.	6.867	-385.1	-337.2	21.88	12.55	27.86	966
28	32.40	7099.	6.479	-357.4	-308.2	22.93	12.65	30.26	924
29	33.45	5854.	6.047	-327.3	-276.5	24.05	12.75	33.28	876
30	34.75	4629.	5.571	-294.0	-241.2	25.24	12.85	37.46	823
31	36.42	3438.	5.033	-256.2	-200.8	26.56	12.99	43.69	762
32	38.79	2272.	4.405	-211.2	-152.2	28.11	13.19	54.84	689
33	42.80	1135.	3.601	-151.2	-86.1	30.14	13.57	83.57	593
34	56.62	198.1	2.212	-27.6	58.5	34.44	16.68	300.97	415
35	94.56	451.3	1.208	145.0	288.8	41.14	15.66	118.28	414
36	113.63	781.7	0.962	204.9	377.6	43.65	14.72	70.47	434
37	127.84	1057.	0.830	244.7	439.0	45.33	14.21	54.36	450
38	139.74	1280.	0.741	276.0	488.4	46.65	13.83	46.07	463
39	150.47	1491.	0.675	303.0	531.7	47.77	13.60	40.97	475
40	160.36	1683.	0.625	327.2	570.9	48.77	13.45	37.65	487
41	169.63	1862.	0.584	349.5	607.3	49.66	13.34	35.26	497
42	178.45	2031.	0.550	370.4	641.6	50.49	13.27	33.45	507
43	186.91	2192.	0.521	390.2	674.3	51.26	13.21	32.04	517
44	195.07	2345.	0.495	409.3	705.8	51.98	13.17	30.91	526
45	202.99	2493.	0.473	427.7	736.2	52.67	13.14	29.97	535
46	210.70	2635.	0.452	445.5	765.8	53.32	13.12	29.19	543
47	218.24	2773.	0.434	462.9	794.6	53.94	13.11	28.53	551
48	225.63	2907.	0.418	479.9	822.9	54.53	13.10	27.96	559
49	232.88	3038.	0.403	496.6	850.6	55.10	13.10	27.48	566
50	240.01	3166.	0.389	513.1	877.8	55.66	13.10	27.05	573
51	247.04	3291.	0.376	529.2	904.7	56.19	13.11	26.68	580
52	253.98	3414.	0.365	545.2	931.2	56.70	13.12	26.35	587
53	260.82	3534.	0.354	561.0	957.4	57.20	13.14	26.07	594
54	267.60	3653.	0.344	576.7	983.4	57.69	13.16	25.82	600
55	274.30	3769.	0.334	592.2	1009.1	58.16	13.19	25.60	606
56	280.92	3883.	0.325	607.7	1034.7	58.62	13.21	25.39	612
57	287.50	3996.	0.317	623.0	1060.0	59.07	13.25	25.22	618
58	294.02	4108.	0.309	638.3	1085.1	59.50	13.29	25.07	624
59	300.49	4218.	0.301	653.4	1110.1	59.93	13.33	24.94	630
60	306.92	4327.	0.294	668.6	1135.0	60.35	13.38	24.83	635
61	313.30	4435.	0.288	683.6	1159.8	60.76	13.44	24.74	641
62	319.64	4542.	0.281	698.7	1184.5	61.16	13.50	24.67	646
63	325.95	4648.	0.275	713.8	1209.2	61.56	13.56	24.61	651
64	332.22	4752.	0.269	728.8	1233.7	61.94	13.63	24.56	656
65	338.46	4856.	0.264	743.9	1258.3	62.32	13.71	24.53	661
66	344.67	4960.	0.259	759.0	1282.8	62.70	13.79	24.51	666
67	350.86	5062.	0.254	774.1	1307.3	63.07	13.88	24.50	670
68	357.01	5163.	0.249	789.2	1331.8	63.43	13.97	24.50	675
69	363.14	5264.	0.244	804.4	1356.3	63.79	14.07	24.52	679
70	369.25	5365.	0.240	819.7	1380.9	64.14	14.17	24.54	683
71	375.33	5464.	0.236	835.0	1405.4	64.49	14.28	24.57	687
72	381.40	5563.	0.232	850.3	1430.0	64.83	14.39	24.61	692
73	387.44	5662.	0.228	865.8	1454.7	65.17	14.51	24.67	696
74	393.46	5760.	0.224	881.3	1479.4	65.51	14.63	24.72	699
75	399.47	5857.	0.220	897.0	1504.1	65.84	14.75	24.79	703
76	405.46	5954.	0.217	912.7	1528.9	66.17	14.88	24.86	707
77	411.43	6051.	0.213	928.5	1553.8	66.50	15.02	24.94	711
78	417.39	6147.	0.210	944.4	1578.8	66.82	15.16	25.03	714
79	423.34	6242.	0.207	960.5	1603.9	67.14	15.30	25.12	718
80	429.27	6338.	0.204	976.6	1629.1	67.45	15.44	25.22	721
81	435.18	6433.	0.201	992.9	1654.3	67.77	15.59	25.33	725
82	441.09	6527.	0.198	1009.3	1679.7	68.08	15.74	25.43	728
83	446.98	6621.	0.195	1025.9	1705.2	68.39	15.90	25.55	731
84	452.86	6715.	0.192	1042.5	1730.8	68.69	16.05	25.67	735
85	458.72	6809.	0.190	1059.4	1756.6	69.00	16.21	25.79	738
86	464.58	6902.	0.187	1076.3	1782.4	69.30	16.37	25.92	741
87	470.43	6995.	0.185	1093.4	1808.4	69.60	16.54	26.05	744
88	476.27	7088.	0.182	1110.6	1834.5	69.90	16.70	26.18	747
89	482.10	7180.	0.180	1128.0	1860.8	70.20	16.87	26.32	750
90	487.91	7272.	0.178	1145.6	1887.2	70.49	17.04	26.46	753
91	493.72	7364.	0.175	1163.3	1913.7	70.79	17.21	26.60	756
92	499.53	7456.	0.173	1181.1	1940.4	71.08	17.38	26.74	759
93	505.32	7547.	0.171	1199.1	1967.2	71.37	17.55	26.89	762
94	511.11	7638.	0.169	1217.3	1994.1	71.65	17.72	27.04	765
95	516.88	7729.	0.167	1235.6	2021.2	71.94	17.90	27.18	768
96	522.66	7820.	0.165	1254.1	2048.5	72.23	18.07	27.33	771
97	528.42	7911.	0.163	1272.8	2075.9	72.51	18.24	27.48	774
98	534.18	8001.	0.161	1291.6	2103.5	72.79	18.42	27.64	777
99	539.93	8091.	0.160	1310.6	2131.2	73.08	18.59	27.79	780
100	545.67	8181.	0.158	1329.7	2159.0	73.36	18.76	27.94	783

• TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

20.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 14.465	25.80	2571[5].	9.465	-621.2	-568.9	10.10	9.75	13.15	1320
15	25.93	25041.	9.433	-614.3	-561.8	10.58	9.91	13.55	1311
16	26.20	23559.	9.339	-600.9	-547.8	11.48	10.23	14.35	1289
17	26.48	22229.	9.206	-586.7	-533.1	12.37	10.55	15.15	1267
18	26.78	20907.	9.063	-571.8	-517.5	13.26	10.86	15.99	1244
19	27.10	19597.	8.920	-556.0	-501.1	14.15	11.14	16.89	1222
20	27.45	18279.	8.768	-539.3	-483.7	15.04	11.41	17.83	1198
21	27.82	17079.	8.600	-521.8	-465.4	15.94	11.64	18.77	1177
22	28.23	15800.	8.415	-503.3	-446.1	16.83	11.85	19.81	1152
23	28.67	14584.	8.211	-483.9	-425.8	17.74	12.03	20.89	1128
24	29.16	13310.	7.981	-463.4	-404.3	18.65	12.19	22.08	1101
25	29.70	12053.	7.723	-441.7	-381.6	19.58	12.32	23.38	1072
26	30.30	10803.	7.436	-418.9	-357.5	20.52	12.44	24.82	1041
27	30.97	9567.	7.119	-394.6	-331.8	21.49	12.54	26.44	1007
28	31.73	8358.	6.773	-368.8	-304.5	22.49	12.64	28.32	970
29	32.61	7170.	6.396	-341.2	-275.1	23.52	12.72	30.55	930
30	33.64	6022.	5.984	-311.4	-243.2	24.60	12.81	33.26	887
31	34.89	4907.	5.538	-279.0	-208.3	25.74	12.90	36.79	839
32	36.44	3836.	5.048	-243.0	-169.1	26.99	13.01	41.61	785
33	38.47	2835.	4.509	-202.1	-124.2	28.37	13.16	48.63	726
34	41.34	1899.	3.900	-153.8	-70.0	29.98	13.37	60.50	657
35	45.92	1128.	3.199	-93.0	0.0	32.01	13.74	81.57	580
36	54.20	641.7	2.448	-12.7	97.1	34.75	14.53	114.58	504
37	67.60	578.2	1.812	78.4	215.4	37.99	14.71	112.04	470
38	81.11	757.9	1.442	148.2	312.5	40.58	14.64	84.14	468
39	92.64	984.2	1.220	198.8	386.5	42.51	14.27	65.59	477
40	102.60	1207.	1.073	238.3	446.2	44.02	13.97	54.68	487
41	111.48	1417.	0.966	271.3	497.2	45.28	13.74	47.77	498
42	119.62	1615.	0.885	300.0	542.5	46.37	13.57	43.09	508
43	127.20	1803.	0.820	326.0	583.7	47.34	13.45	39.72	517
44	134.19	1976.	0.767	349.6	621.5	48.21	13.36	37.27	526
45	141.03	2146.	0.723	372.0	657.8	49.02	13.31	35.38	536
46	147.60	2310.	0.684	393.3	692.4	49.78	13.28	33.86	544
47	153.95	2467.	0.650	413.7	725.6	50.50	13.26	32.60	552
48	160.11	2619.	0.620	433.3	757.7	51.17	13.24	31.56	560
49	166.10	2766.	0.594	452.2	788.8	51.82	13.24	30.69	568
50	171.96	2909.	0.570	470.7	819.1	52.43	13.24	29.95	575
51	177.69	3048.	0.548	488.7	848.8	53.01	13.24	29.31	582
52	183.31	3184.	0.528	506.3	877.8	53.58	13.25	28.75	589
53	188.84	3316.	0.510	523.6	906.3	54.12	13.27	28.27	596
54	194.28	3446.	0.493	540.6	934.3	54.64	13.28	27.85	603
55	199.64	3573.	0.477	557.4	962.0	55.15	13.31	27.47	609
56	204.91	3697.	0.463	574.3	989.5	55.65	13.33	27.12	615
57	210.14	3819.	0.449	590.6	1016.5	56.13	13.36	26.83	621
58	215.30	3940.	0.437	606.9	1043.2	56.59	13.39	26.58	627
59	220.41	4059.	0.425	623.0	1069.7	57.04	13.43	26.36	633
60	225.48	4176.	0.414	639.0	1095.9	57.48	13.48	26.16	638
61	230.50	4291.	0.404	654.9	1122.0	57.92	13.53	26.00	644
62	235.47	4405.	0.394	670.7	1147.9	58.34	13.59	25.85	649
63	240.41	4518.	0.385	686.5	1173.7	58.75	13.65	25.73	654
64	245.31	4630.	0.376	702.3	1199.4	59.15	13.71	25.62	659
65	250.18	4740.	0.368	718.0	1225.0	59.55	13.79	25.54	664
66	255.02	4849.	0.360	733.7	1250.5	59.94	13.87	25.47	669
67	259.83	4958.	0.352	749.4	1275.9	60.32	13.95	25.42	674
68	264.61	5065.	0.345	765.1	1301.3	60.70	14.04	25.38	678
69	269.37	5171.	0.338	780.8	1326.7	61.07	14.13	25.35	683
70	274.10	5277.	0.332	796.5	1352.0	61.43	14.23	25.34	687
71	278.81	5382.	0.325	812.3	1377.4	61.79	14.34	25.34	691
72	283.50	5486.	0.319	828.2	1402.7	62.15	14.45	25.35	695
73	288.17	5589.	0.314	844.1	1428.1	62.50	14.56	25.37	699
74	292.82	5691.	0.308	860.0	1453.4	62.84	14.68	25.40	703
75	297.45	5793.	0.303	876.1	1478.9	63.18	14.81	25.44	707
76	302.07	5894.	0.298	892.2	1504.3	63.52	14.93	25.49	711
77	306.66	5995.	0.293	908.4	1529.8	63.85	15.07	25.55	715
78	311.25	6095.	0.288	924.7	1555.4	64.18	15.20	25.61	718
79	315.81	6195.	0.283	941.1	1581.1	64.51	15.34	25.68	722
80	320.37	6294.	0.279	957.6	1606.8	64.83	15.49	25.76	725
81	324.91	6393.	0.275	974.2	1632.6	65.16	15.63	25.85	729
82	329.44	6491.	0.270	990.9	1658.5	65.47	15.78	25.94	732
83	333.95	6588.	0.266	1007.7	1684.5	65.79	15.93	26.04	736
84	338.46	6685.	0.263	1024.7	1710.6	66.10	16.09	26.14	739
85	342.95	6782.	0.259	1041.8	1736.8	66.41	16.25	26.25	742
86	347.43	6879.	0.255	1059.0	1763.1	66.72	16.41	26.36	745
87	351.90	6975.	0.252	1076.4	1789.5	67.02	16.57	26.48	748
88	356.37	7071.	0.248	1093.9	1816.0	67.33	16.74	26.60	752
89	360.82	7166.	0.245	1111.5	1842.7	67.63	16.90	26.72	755
90	365.26	7261.	0.242	1129.3	1869.5	67.93	17.07	26.85	758
91	369.70	7356.	0.238	1147.2	1896.4	68.23	17.24	26.98	761
92	374.13	7450.	0.235	1165.3	1923.5	68.52	17.41	27.12	764
93	378.55	7544.	0.232	1183.5	1950.6	68.81	17.58	27.25	767
94	382.96	7638.	0.230	1201.9	1978.0	69.11	17.75	27.39	770
95	387.36	7731.	0.227	1220.4	2005.4	69.40	17.92	27.53	773
96	391.76	7825.	0.224	1239.1	2033.0	69.69	18.10	27.67	775
97	396.15	7918.	0.221	1258.0	2060.8	69.97	18.27	27.81	778
98	400.53	8011.	0.219	1277.0	2088.6	70.26	18.44	27.96	781
99	404.91	8103.	0.216	1296.1	2116.7	70.54	18.61	28.10	784
100	409.28	8195.	0.214	1315.4	2144.8	70.83	18.79	28.24	787

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

25.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME $CM^3/GMOLE$	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 14.626	25.71	26386.	9.482	-620.6	-555.5	10.12	9.80	13.14	1333
15	25.80	25929.	9.465	-615.9	-550.5	10.45	9.91	13.41	1328
16	26.05	24428.	9.397	-602.7	-536.7	11.34	10.23	14.21	1306
17	26.32	23137.	9.300	-588.8	-522.2	12.23	10.54	15.00	1286
18	26.61	21830.	9.163	-574.2	-506.7	13.11	10.84	15.81	1265
19	26.92	20533.	9.025	-558.7	-490.5	13.99	11.13	16.66	1243
20	27.25	19224.	8.881	-542.4	-473.4	14.87	11.39	17.56	1221
21	27.61	18046.	8.722	-525.3	-455.4	15.74	11.62	18.46	1200
22	27.99	16781.	8.546	-507.4	-436.5	16.62	11.83	19.43	1177
23	28.40	15597.	8.353	-488.5	-416.5	17.51	12.02	20.43	1154
24	28.86	14349.	8.136	-468.7	-395.6	18.40	12.18	21.52	1129
25	29.35	13121.	7.898	-447.8	-373.5	19.31	12.31	22.69	1102
26	29.90	11900.	7.632	-425.9	-350.1	20.22	12.43	23.96	1074
27	30.50	10699.	7.340	-402.8	-325.5	21.15	12.54	25.36	1043
28	31.18	9532.	7.025	-378.4	-299.4	22.10	12.63	26.91	1010
29	31.94	8385.	6.682	-352.5	-271.6	23.07	12.72	28.68	975
30	32.81	7283.	6.317	-325.1	-241.9	24.08	12.79	30.72	938
31	33.82	6210.	5.924	-295.7	-210.1	25.12	12.87	33.17	897
32	35.01	5186.	5.505	-264.1	-175.4	26.22	12.95	36.18	853
33	36.45	4225.	5.058	-229.7	-137.4	27.40	13.04	39.95	807
34	38.25	3321.	4.582	-191.8	-94.9	28.66	13.15	45.01	756
35	40.57	2521.	4.074	-149.5	-46.7	30.06	13.29	51.72	702
36	43.69	1851.	3.537	-101.3	9.3	31.64	13.49	60.57	646
37	48.02	1352.	3.007	-46.6	75.1	33.44	13.77	71.58	594
38	54.04	1061.	2.485	14.3	151.2	35.47	14.06	79.50	549
39	61.52	983.3	2.067	75.5	231.4	37.55	14.24	79.24	525
40	69.62	1052.	1.753	130.9	307.3	39.47	14.20	71.55	516
41	77.52	1195.	1.523	178.0	374.3	41.13	14.05	62.53	517
42	84.94	1364.	1.353	217.9	433.1	42.55	13.89	55.11	522
43	91.87	1542.	1.223	252.5	485.2	43.77	13.74	49.44	528
44	98.36	1720.	1.121	283.3	532.4	44.86	13.63	45.14	535
45	104.49	1896.	1.038	311.1	575.8	45.83	13.54	41.84	543
46	110.33	2066.	0.969	336.8	616.3	46.72	13.47	39.27	550
47	115.92	2232.	0.911	360.9	654.5	47.55	13.42	37.22	558
48	121.31	2393.	0.861	383.6	690.8	48.31	13.39	35.56	565
49	126.52	2550.	0.817	405.2	725.7	49.03	13.37	34.19	572
50	131.57	2702.	0.779	426.0	759.3	49.71	13.36	33.05	580
51	136.51	2853.	0.746	446.1	791.9	50.35	13.36	32.13	587
52	141.33	2999.	0.716	465.6	823.6	50.97	13.37	31.38	595
53	146.06	3141.	0.688	484.7	854.7	51.56	13.39	30.68	601
54	150.69	3280.	0.663	503.3	885.0	52.13	13.40	30.05	608
55	155.24	3416.	0.639	521.6	914.8	52.68	13.43	29.50	614
56	159.69	3547.	0.617	539.8	944.4	53.21	13.45	28.97	620
57	164.10	3677.	0.597	557.4	973.1	53.72	13.47	28.54	626
58	168.44	3805.	0.579	574.8	1001.5	54.21	13.50	28.17	632
59	172.73	3931.	0.562	591.9	1029.5	54.69	13.53	27.84	638
60	176.96	4055.	0.546	608.9	1057.2	55.15	13.57	27.55	643
61	181.16	4177.	0.531	625.7	1084.6	55.61	13.62	27.30	649
62	185.30	4297.	0.517	642.4	1111.8	56.05	13.67	27.07	654
63	189.41	4416.	0.504	658.9	1138.8	56.48	13.73	26.88	659
64	193.49	4534.	0.491	675.4	1165.6	56.90	13.79	26.71	664
65	197.53	4649.	0.479	691.8	1192.2	57.32	13.86	26.57	669
66	201.53	4764.	0.468	708.2	1218.7	57.72	13.94	26.45	674
67	205.51	4877.	0.458	724.5	1245.1	58.12	14.02	26.34	679
68	209.47	4990.	0.448	740.8	1271.4	58.51	14.11	26.26	683
69	213.39	5101.	0.438	757.1	1297.6	58.89	14.20	26.19	688
70	217.29	5211.	0.429	773.4	1323.8	59.27	14.30	26.14	692
71	221.17	5320.	0.421	789.7	1349.9	59.64	14.40	26.10	696
72	225.03	5428.	0.412	806.0	1376.0	60.00	14.51	26.08	700
73	228.87	5536.	0.405	822.3	1402.1	60.36	14.62	26.07	704
74	232.69	5642.	0.397	838.7	1428.2	60.72	14.74	26.07	708
75	236.49	5748.	0.390	855.2	1454.2	61.07	14.86	26.09	712
76	240.27	5853.	0.383	871.7	1480.3	61.41	14.98	26.11	716
77	244.04	5958.	0.376	888.3	1506.5	61.75	15.11	26.15	720
78	247.79	6061.	0.370	905.0	1532.6	62.09	15.25	26.19	723
79	251.53	6164.	0.363	921.7	1558.8	62.43	15.39	26.24	727
80	255.25	6267.	0.358	938.5	1585.1	62.76	15.53	26.30	730
81	258.96	6369.	0.352	955.5	1611.5	63.08	15.67	26.37	734
82	262.66	6470.	0.346	972.5	1637.9	63.41	15.82	26.44	737
83	266.35	6571.	0.341	989.7	1664.3	63.73	15.97	26.52	741
84	270.02	6671.	0.336	1006.9	1690.9	64.05	16.13	26.61	744
85	273.68	6771.	0.331	1024.3	1717.6	64.36	16.28	26.70	747
86	277.34	6870.	0.326	1041.8	1744.3	64.68	16.44	26.80	750
87	280.98	6969.	0.321	1059.4	1771.2	64.99	16.60	26.91	753
88	284.61	7068.	0.317	1077.2	1798.1	65.29	16.77	27.01	756
89	288.24	7166.	0.312	1095.1	1825.2	65.60	16.93	27.13	760
90	291.86	7263.	0.308	1113.1	1852.4	65.90	17.10	27.24	763
91	295.46	7361.	0.304	1131.2	1879.7	66.21	17.27	27.36	766
92	299.06	7457.	0.300	1149.6	1907.1	66.50	17.44	27.48	769
93	302.65	7554.	0.296	1168.0	1934.7	66.80	17.61	27.61	772
94	306.24	7650.	0.292	1186.6	1962.3	67.10	17.78	27.74	775
95	309.81	7746.	0.288	1205.3	1990.1	67.39	17.95	27.87	777
96	313.38	7842.	0.285	1224.2	2018.1	67.69	18.12	28.00	780
97	316.95	7937.	0.281	1243.3	2046.1	67.98	18.29	28.13	783
98	320.50	8032.	0.278	1262.5	2074.3	68.27	18.47	28.27	786
99	324.05	8126.	0.275	1281.8	2102.7	68.55	18.64	28.40	789
100	327.60	8221.	0.271	1301.3	2131.1	68.84	18.81	28.54	792

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

30.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_V, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 14.785	25.63	27055.	9.500	-620.1	-542.2	10.14	9.84	13.13	1347
15	25.68	26806.	9.495	-617.4	-539.3	10.33	9.91	13.28	1344
16	25.92	25276.	9.448	-604.4	-525.6	11.22	10.23	14.07	1322
17	26.18	24017.	9.366	-590.8	-511.2	12.09	10.54	14.85	1304
18	26.45	22721.	9.252	-576.4	-496.0	12.96	10.83	15.64	1284
19	26.75	21444.	9.124	-561.2	-479.9	13.83	11.11	16.46	1263
20	27.06	20156.	8.988	-545.3	-463.0	14.70	11.37	17.32	1242
21	27.40	18981.	8.837	-528.6	-445.3	15.56	11.61	18.18	1222
22	27.76	17736.	8.669	-511.0	-426.6	16.43	11.82	19.10	1200
23	28.15	16572.	8.485	-492.7	-407.1	17.30	12.00	20.03	1179
24	28.58	15348.	8.281	-473.4	-386.6	18.17	12.17	21.04	1155
25	29.04	14143.	8.056	-453.3	-365.0	19.05	12.31	22.11	1130
26	29.54	12949.	7.809	-432.1	-342.3	19.94	12.43	23.25	1104
27	30.09	11776.	7.538	-409.9	-318.5	20.84	12.54	24.49	1075
28	30.70	10647.	7.244	-386.6	-293.3	21.76	12.63	25.82	1046
29	31.38	9525.	6.931	-362.2	-266.8	22.69	12.72	27.31	1014
30	32.14	8458.	6.596	-336.4	-238.7	23.64	12.79	28.94	981
31	33.00	7408.	6.242	-309.1	-208.8	24.62	12.86	30.85	945
32	33.98	6411.	5.868	-280.2	-176.9	25.63	12.93	33.04	907
33	35.13	5470.	5.475	-249.4	-142.6	26.69	13.00	35.61	868
34	36.47	4592.	5.064	-216.4	-105.5	27.79	13.07	38.67	826
35	38.09	3785.	4.636	-180.8	-65.0	28.97	13.16	42.38	783
36	40.06	3075.	4.194	-142.3	-20.5	30.22	13.26	46.75	738
37	42.52	2474.	3.745	-100.5	28.8	31.57	13.39	51.82	694
38	45.60	1998.	3.303	-55.2	83.4	33.03	13.54	57.24	652
39	49.43	1668.	2.884	-7.2	143.1	34.58	13.70	61.86	615
40	54.03	1479.	2.510	42.1	206.4	36.18	13.83	64.27	588
41	59.26	1418.	2.194	90.4	270.6	37.77	13.91	63.45	570
42	64.83	1449.	1.936	135.7	332.7	39.27	13.88	60.12	562
43	70.45	1539.	1.728	176.7	390.9	40.63	13.83	55.79	559
44	75.98	1662.	1.562	213.7	444.6	41.87	13.75	51.55	560
45	81.31	1804.	1.428	247.1	494.3	42.99	13.68	47.76	563
46	86.45	1954.	1.318	277.6	540.4	44.00	13.61	44.57	567
47	91.39	2109.	1.226	305.7	583.5	44.93	13.56	41.90	572
48	96.16	2265.	1.148	332.0	624.3	45.79	13.52	39.70	578
49	100.77	2419.	1.081	356.7	663.0	46.58	13.49	37.86	584
50	105.24	2572.	1.023	380.2	700.1	47.33	13.47	36.32	590
51	109.59	2722.	0.972	402.6	735.7	48.04	13.47	35.02	596
52	113.82	2870.	0.927	424.2	770.2	48.71	13.47	33.92	603
53	117.96	3015.	0.887	445.0	803.6	49.35	13.48	32.96	609
54	122.01	3157.	0.850	465.3	836.1	49.95	13.50	32.15	615
55	125.98	3297.	0.817	485.0	867.9	50.54	13.52	31.44	621
56	129.88	3434.	0.787	504.8	899.6	51.11	13.55	30.82	627
57	133.79	3576.	0.759	523.8	930.5	51.65	13.57	30.23	633
58	137.57	3709.	0.734	542.3	960.5	52.18	13.60	29.77	639
59	141.29	3840.	0.711	560.5	990.0	52.68	13.63	29.34	645
60	144.97	3969.	0.689	578.5	1019.2	53.17	13.66	28.95	650
61	148.59	4096.	0.669	596.3	1048.0	53.65	13.71	28.61	655
62	152.18	4221.	0.650	613.8	1076.4	54.11	13.75	28.30	661
63	155.72	4344.	0.632	631.2	1104.6	54.56	13.81	28.04	666
64	159.23	4466.	0.615	648.5	1132.5	55.00	13.87	27.80	671
65	162.71	4586.	0.599	665.6	1160.2	55.43	13.94	27.60	676
66	166.15	4705.	0.585	682.6	1187.7	55.85	14.01	27.42	680
67	169.57	4823.	0.571	699.6	1215.1	56.26	14.09	27.27	685
68	172.96	4939.	0.557	716.5	1242.3	56.66	14.17	27.14	689
69	176.32	5054.	0.545	733.4	1269.3	57.06	14.26	27.03	694
70	179.66	5168.	0.533	750.2	1296.3	57.45	14.36	26.94	698
71	182.98	5281.	0.522	767.0	1323.2	57.83	14.46	26.87	702
72	186.28	5393.	0.511	783.8	1350.1	58.20	14.56	26.81	706
73	189.56	5504.	0.501	800.6	1376.9	58.57	14.67	26.77	710
74	192.82	5614.	0.491	817.5	1403.6	58.94	14.79	26.74	714
75	196.06	5723.	0.481	834.4	1430.3	59.30	14.91	26.73	718
76	199.28	5831.	0.472	851.3	1457.1	59.65	15.03	26.73	722
77	202.49	5939.	0.464	868.3	1483.8	60.00	15.16	26.74	726
78	205.68	6046.	0.455	885.3	1510.6	60.35	15.29	26.76	729
79	208.86	6152.	0.447	902.4	1537.3	60.69	15.43	26.79	733
80	212.03	6257.	0.440	919.6	1564.1	61.02	15.57	26.83	736
81	215.18	6362.	0.432	936.9	1591.0	61.36	15.71	26.88	740
82	218.32	6466.	0.425	954.2	1617.9	61.69	15.86	26.93	743
83	221.45	6569.	0.418	971.7	1644.9	62.01	16.01	27.00	746
84	224.57	6672.	0.412	989.3	1671.9	62.34	16.16	27.07	749
85	227.68	6775.	0.405	1006.9	1699.0	62.66	16.32	27.15	753
86	230.77	6877.	0.399	1024.7	1726.2	62.98	16.48	27.23	756
87	233.86	6978.	0.393	1042.6	1753.5	63.29	16.64	27.32	759
88	236.94	7079.	0.388	1060.6	1780.8	63.60	16.80	27.42	762
89	240.01	7179.	0.382	1078.8	1808.3	63.92	16.96	27.52	765
90	243.07	7279.	0.377	1097.0	1835.9	64.22	17.13	27.62	768
91	246.12	7379.	0.371	1115.4	1863.6	64.53	17.30	27.73	771
92	249.16	7478.	0.366	1134.0	1891.3	64.83	17.47	27.84	774
93	252.20	7576.	0.361	1152.6	1919.2	65.13	17.63	27.96	777
94	255.23	7675.	0.356	1171.4	1947.3	65.43	17.80	28.08	780
95	258.25	7773.	0.352	1190.4	1975.4	65.73	17.98	28.20	783
96	261.27	7870.	0.347	1209.5	2003.7	66.03	18.15	28.32	786
97	264.27	7967.	0.343	1228.7	2032.0	66.32	18.32	28.45	789
98	267.28	8064.	0.339	1248.1	2060.6	66.61	18.49	28.57	791
99	270.27	8161.	0.334	1267.6	2089.2	66.90	18.66	28.70	794
100	273.26	8257.	0.330	1287.3	2118.0	67.19	18.83	28.83	797

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

35.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 14.942	25.54	27739.	9.510	-619.4	-528.9	10.17	9.89	13.11	1360
15	25.56	27675.	9.511	-618.7	-528.1	10.22	9.91	13.15	1359
16	25.79	26122.	9.490	-606.0	-514.5	11.09	10.22	13.94	1338
17	26.04	24876.	9.428	-592.6	-500.2	11.96	10.53	14.70	1321
18	26.30	23587.	9.337	-578.4	-485.1	12.82	10.82	15.49	1302
19	26.59	22329.	9.215	-563.5	-469.3	13.68	11.10	16.28	1283
20	26.89	21062.	9.085	-547.9	-452.6	14.54	11.36	17.10	1262
21	27.21	19894.	8.943	-531.6	-435.1	15.39	11.59	17.92	1243
22	27.55	18668.	8.784	-514.4	-416.7	16.24	11.80	18.80	1222
23	27.92	17513.	8.608	-496.5	-397.5	17.10	11.99	19.68	1202
24	28.32	16315.	8.415	-477.8	-377.3	17.96	12.16	20.62	1179
25	28.75	15130.	8.202	-458.2	-356.2	18.82	12.30	21.61	1156
26	29.22	13959.	7.970	-437.7	-334.1	19.69	12.42	22.66	1131
27	29.73	12809.	7.717	-416.3	-310.9	20.56	12.54	23.78	1105
28	30.29	11702.	7.443	-393.9	-286.5	21.45	12.64	24.96	1078
29	30.90	10609.	7.150	-370.5	-261.0	22.34	12.72	26.24	1049
30	31.58	9564.	6.840	-346.0	-234.0	23.26	12.79	27.62	1019
31	32.33	8535.	6.514	-320.3	-205.7	24.19	12.86	29.18	987
32	33.18	7556.	6.172	-293.3	-175.6	25.14	12.93	30.92	953
33	34.13	6625.	5.816	-264.8	-143.8	26.12	12.99	32.88	918
34	35.23	5767.	5.447	-234.8	-109.9	27.13	13.04	35.04	882
35	36.49	4959.	5.066	-203.0	-73.6	28.18	13.11	37.55	845
36	37.96	4230.	4.677	-169.3	-34.7	29.28	13.17	40.37	807
37	39.70	3586.	4.284	-133.5	7.2	30.43	13.25	43.49	769
38	41.75	3035.	3.891	-95.6	52.4	31.63	13.34	46.83	732
39	44.19	2590.	3.510	-55.8	100.9	32.89	13.42	50.13	697
40	47.06	2255.	3.149	-14.3	152.6	34.20	13.52	53.00	667
41	50.38	2026.	2.818	28.0	206.6	35.53	13.61	54.93	641
42	54.09	1897.	2.523	70.1	261.9	36.87	13.67	55.48	622
43	58.12	1854.	2.269	111.0	317.1	38.17	13.71	54.58	609
44	62.34	1872.	2.051	149.8	370.8	39.40	13.71	52.65	601
45	66.63	1935.	1.868	186.1	422.4	40.56	13.68	50.18	597
46	70.92	2028.	1.714	219.9	471.4	41.64	13.65	47.61	596
47	75.13	2143.	1.585	251.4	517.8	42.64	13.62	45.12	597
48	79.26	2270.	1.475	280.7	561.8	43.56	13.59	42.86	600
49	83.30	2404.	1.380	308.2	603.6	44.43	13.57	40.86	603
50	87.23	2543.	1.299	334.3	643.6	45.23	13.55	39.13	608
51	91.07	2684.	1.228	359.0	682.0	45.99	13.54	37.62	612
52	94.82	2825.	1.165	382.6	718.9	46.71	13.54	36.32	617
53	98.49	2966.	1.110	405.4	754.6	47.39	13.55	35.19	622
54	102.08	3106.	1.060	427.3	789.3	48.04	13.57	34.20	627
55	105.61	3245.	1.015	448.6	823.1	48.66	13.59	33.33	633
56	109.06	3382.	0.975	469.8	856.5	49.26	13.61	32.58	638
57	112.46	3518.	0.938	489.9	888.8	49.83	13.63	31.90	643
58	115.81	3652.	0.904	509.7	920.4	50.38	13.65	31.30	649
59	119.11	3784.	0.873	529.0	951.4	50.91	13.69	30.77	654
60	122.36	3915.	0.844	548.0	981.9	51.43	13.73	30.30	659
61	125.57	4044.	0.818	566.7	1012.0	51.92	13.77	29.88	664
62	128.74	4172.	0.793	585.2	1041.7	52.41	13.82	29.52	669
63	131.87	4299.	0.770	603.4	1071.1	52.88	13.88	29.19	674
64	135.04	4429.	0.748	621.6	1100.5	53.34	13.94	28.88	679
65	138.11	4553.	0.728	639.4	1129.2	53.79	14.01	28.62	684
66	141.14	4674.	0.708	657.2	1157.7	54.22	14.08	28.38	688
67	144.15	4795.	0.690	674.8	1186.0	54.65	14.15	28.17	693
68	147.12	4914.	0.673	692.3	1214.1	55.06	14.23	28.00	697
69	150.08	5032.	0.657	709.8	1242.0	55.47	14.32	27.85	701
70	153.01	5149.	0.642	727.1	1269.8	55.87	14.41	27.72	705
71	155.92	5265.	0.628	744.5	1297.4	56.26	14.51	27.61	710
72	158.81	5380.	0.614	761.8	1325.0	56.65	14.61	27.52	714
73	161.68	5493.	0.601	779.1	1352.5	57.03	14.72	27.45	717
74	164.53	5606.	0.589	796.4	1379.9	57.40	14.84	27.39	721
75	167.37	5718.	0.577	813.7	1407.3	57.77	14.95	27.35	725
76	170.19	5829.	0.566	831.1	1434.6	58.13	15.08	27.33	729
77	172.99	5939.	0.555	848.4	1461.9	58.49	15.20	27.31	732
78	175.78	6048.	0.545	865.9	1489.2	58.84	15.33	27.31	736
79	178.56	6157.	0.535	883.3	1516.6	59.19	15.47	27.32	739
80	181.32	6265.	0.525	900.9	1543.9	59.53	15.61	27.34	743
81	184.07	6372.	0.516	918.5	1571.2	59.87	15.75	27.37	746
82	186.81	6478.	0.507	936.2	1598.6	60.21	15.90	27.41	749
83	189.53	6584.	0.499	953.9	1626.1	60.54	16.05	27.46	753
84	192.25	6689.	0.491	971.8	1653.6	60.87	16.20	27.52	756
85	194.96	6794.	0.483	989.7	1681.1	61.19	16.35	27.58	759
86	197.65	6898.	0.475	1007.8	1708.7	61.52	16.51	27.65	762
87	200.34	7001.	0.468	1025.9	1736.4	61.84	16.67	27.73	765
88	203.02	7104.	0.461	1044.2	1764.2	62.15	16.83	27.81	768
89	205.68	7206.	0.454	1062.6	1792.0	62.47	16.99	27.90	771
90	208.35	7308.	0.447	1081.1	1820.0	62.78	17.16	27.99	774
91	211.00	7410.	0.441	1099.8	1848.0	63.09	17.32	28.09	777
92	213.64	7511.	0.435	1118.5	1876.2	63.40	17.49	28.19	780
93	216.28	7611.	0.429	1137.4	1904.4	63.70	17.66	28.30	783
94	218.91	7712.	0.423	1156.4	1932.8	64.01	17.83	28.41	786
95	221.53	7811.	0.417	1175.6	1961.2	64.31	18.00	28.52	789
96	224.15	7911.	0.412	1194.9	1989.8	64.61	18.17	28.63	792
97	226.76	8010.	0.406	1214.3	2018.5	64.90	18.34	28.75	794
98	229.37	8108.	0.401	1233.9	2047.3	65.20	18.51	28.87	797
99	231.96	8207.	0.396	1253.6	2076.2	65.49	18.68	28.99	800
100	234.56	8304.	0.391	1273.5	2105.3	65.79	18.85	29.11	803

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

40.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3 ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 15.097	25.46	28373.	9.525	-618.8	-515.6	10.19	9.93	13.10	1372
16	25.67	26957.	9.531	-607.4	-503.4	10.97	10.21	13.81	1354
17	25.91	25709.	9.484	-594.2	-489.2	11.83	10.52	14.57	1337
18	26.16	24429.	9.405	-580.3	-474.3	12.69	10.82	15.34	1319
19	26.43	23196.	9.299	-565.7	-458.6	13.53	11.09	16.11	1301
20	26.72	21955.	9.177	-550.4	-442.1	14.38	11.35	16.90	1282
21	27.03	20782.	9.044	-534.4	-424.8	15.22	11.58	17.70	1264
22	27.36	19577.	8.893	-517.6	-406.7	16.07	11.79	18.53	1244
23	27.71	18429.	8.725	-500.1	-387.8	16.91	11.98	19.37	1224
24	28.09	17252.	8.541	-481.8	-367.9	17.75	12.15	20.26	1203
25	28.49	16085.	8.339	-462.7	-347.2	18.60	12.29	21.18	1180
26	28.93	14934.	8.119	-442.8	-325.6	19.45	12.42	22.15	1157
27	29.40	13806.	7.880	-422.1	-302.9	20.30	12.54	23.17	1133
28	29.92	12719.	7.624	-400.5	-279.2	21.16	12.64	24.24	1107
29	30.48	11664.	7.348	-377.9	-254.4	22.03	12.73	25.38	1080
30	31.09	10618.	7.058	-354.5	-228.5	22.91	12.80	26.59	1053
31	31.76	9606.	6.754	-330.0	-201.2	23.81	12.87	27.92	1023
32	32.51	8641.	6.436	-304.4	-172.6	24.71	12.93	29.36	993
33	33.34	7721.	6.109	-277.6	-142.5	25.64	12.99	30.95	962
34	34.27	6873.	5.769	-249.7	-110.8	26.59	13.04	32.63	930
35	35.32	6068.	5.420	-220.4	-77.2	27.56	13.09	34.52	897
36	36.51	5325.	5.066	-189.6	-41.7	28.56	13.14	36.58	863
37	37.87	4657.	4.709	-157.5	-4.0	29.59	13.20	38.79	829
38	39.42	4065.	4.352	-123.8	36.0	30.66	13.25	41.14	796
39	41.20	3558.	4.002	-88.7	78.3	31.76	13.31	43.50	765
40	43.25	3142.	3.662	-52.4	122.9	32.89	13.36	45.72	735
41	45.57	2811.	3.341	-15.0	169.7	34.04	13.42	47.68	708
42	48.18	2567.	3.043	22.8	218.1	35.21	13.48	49.12	686
43	51.06	2407.	2.772	60.6	267.6	36.37	13.54	49.80	667
44	54.17	2318.	2.530	97.8	317.4	37.52	13.57	49.68	653
45	57.45	2287.	2.316	133.9	366.8	38.63	13.59	48.89	643
46	60.85	2301.	2.129	168.5	415.2	39.70	13.61	47.59	636
47	64.30	2353.	1.967	201.4	462.0	40.70	13.61	45.98	632
48	67.76	2429.	1.827	232.6	507.2	41.65	13.60	44.27	630
49	71.20	2525.	1.705	262.1	550.6	42.55	13.59	42.57	630
50	74.61	2637.	1.599	290.0	592.4	43.39	13.59	40.97	632
51	77.96	2750.	1.506	316.6	632.6	44.19	13.59	39.49	634
52	81.26	2874.	1.425	342.1	671.4	44.94	13.59	38.16	637
53	84.51	3001.	1.352	366.5	709.0	45.66	13.60	36.96	640
54	87.70	3131.	1.288	390.0	745.4	46.34	13.61	35.90	644
55	90.83	3262.	1.229	412.6	780.8	46.99	13.64	34.94	648
56	93.92	3393.	1.177	435.2	815.8	47.62	13.66	34.10	653
57	96.95	3524.	1.130	456.6	849.5	48.22	13.68	33.34	657
58	99.94	3655.	1.086	477.5	882.5	48.79	13.70	32.66	662
59	102.89	3785.	1.047	497.9	914.9	49.35	13.73	32.06	666
60	105.80	3915.	1.010	517.9	946.7	49.88	13.77	31.52	671
61	108.67	4043.	0.977	537.5	978.0	50.40	13.82	31.04	676
62	111.51	4171.	0.945	556.8	1008.8	50.90	13.87	30.61	680
63	114.31	4297.	0.917	575.9	1039.2	51.36	13.92	30.23	685
64	117.08	4423.	0.889	594.7	1069.2	51.86	13.98	29.88	689
65	119.83	4547.	0.864	613.3	1099.0	52.32	14.05	29.58	694
66	122.54	4670.	0.840	631.8	1128.4	52.77	14.12	29.31	698
67	125.24	4792.	0.818	650.0	1157.6	53.21	14.20	29.07	702
68	127.90	4913.	0.797	668.2	1186.6	53.64	14.28	28.86	706
69	130.54	5033.	0.777	686.3	1215.3	54.06	14.37	28.68	710
70	133.16	5152.	0.758	704.2	1243.9	54.47	14.47	28.51	714
71	135.82	5272.	0.740	722.2	1272.6	54.87	14.56	28.36	718
72	138.39	5389.	0.723	740.0	1300.9	55.27	14.66	28.23	722
73	140.95	5504.	0.707	757.8	1329.1	55.66	14.77	28.11	726
74	143.49	5619.	0.691	775.5	1357.1	56.04	14.88	28.02	729
75	146.02	5733.	0.677	793.3	1385.1	56.42	15.00	27.95	733
76	148.53	5846.	0.663	811.0	1413.0	56.79	15.12	27.90	736
77	151.02	5958.	0.650	828.8	1440.9	57.15	15.25	27.87	740
78	153.51	6069.	0.637	846.6	1468.8	57.51	15.38	27.84	743
79	155.97	6180.	0.625	864.4	1496.6	57.86	15.51	27.83	747
80	158.43	6289.	0.614	882.3	1524.4	58.21	15.65	27.84	750
81	160.87	6398.	0.603	900.3	1552.3	58.56	15.79	27.85	753
82	163.31	6507.	0.592	918.3	1580.2	58.90	15.93	27.87	756
83	165.73	6614.	0.582	936.3	1608.0	59.24	16.08	27.91	760
84	168.14	6721.	0.572	954.5	1636.0	59.57	16.23	27.95	763
85	170.54	6828.	0.563	972.7	1663.9	59.91	16.38	28.00	766
86	172.93	6933.	0.553	991.1	1692.0	60.23	16.54	28.05	769
87	175.32	7039.	0.545	1009.5	1720.1	60.56	16.70	28.12	772
88	177.69	7143.	0.536	1028.0	1748.2	60.88	16.86	28.19	775
89	180.06	7247.	0.528	1046.7	1776.4	61.20	17.02	28.27	778
90	182.42	7351.	0.520	1065.4	1804.7	61.52	17.19	28.35	781
91	184.77	7454.	0.512	1084.3	1833.1	61.83	17.35	28.44	784
92	187.11	7557.	0.505	1103.3	1861.6	62.14	17.52	28.53	786
93	189.44	7659.	0.498	1122.4	1890.2	62.45	17.69	28.62	789
94	191.77	7761.	0.491	1141.6	1918.9	62.76	17.86	28.72	792
95	194.10	7862.	0.484	1161.0	1947.7	63.06	18.02	28.83	795
96	196.41	7963.	0.477	1180.5	1976.5	63.36	18.19	28.93	798
97	198.72	8063.	0.471	1200.1	2005.5	63.66	18.36	29.04	801
98	201.03	8163.	0.465	1219.9	2034.6	63.96	18.53	29.16	803
99	203.32	8263.	0.459	1239.8	2063.8	64.26	18.70	29.27	806
100	205.62	8362.	0.453	1259.8	2093.2	64.55	18.87	29.38	809

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

45.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME $CM^3/GMOLE$	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 15.250	25.38	28966.	9.544	-618.1	-502.3	10.21	9.97	13.10	1383
16	25.55	27778.	9.562	-608.8	-492.3	10.86	10.20	13.69	1368
17	25.78	26526.	9.533	-595.8	-478.2	11.71	10.51	14.44	1353
18	26.02	25253.	9.470	-582.1	-463.4	12.55	10.81	15.19	1336
19	26.29	24043.	9.378	-567.7	-447.9	13.40	11.08	15.95	1319
20	26.56	22824.	9.263	-552.7	-431.5	14.23	11.33	16.71	1300
21	26.86	21649.	9.136	-536.9	-414.5	15.07	11.57	17.48	1282
22	27.17	20465.	8.994	-520.5	-396.6	15.90	11.78	18.28	1264
23	27.51	19320.	8.835	-503.3	-377.9	16.73	11.97	19.09	1245
24	27.86	18163.	8.659	-485.4	-358.4	17.56	12.14	19.93	1224
25	28.25	17013.	8.467	-466.8	-338.0	18.39	12.29	20.81	1203
26	28.66	15881.	8.258	-447.4	-316.8	19.22	12.42	21.71	1181
27	29.10	14771.	8.032	-427.3	-294.6	20.06	12.54	22.66	1158
28	29.58	13700.	7.788	-406.3	-271.5	20.90	12.64	23.64	1135
29	30.10	12644.	7.529	-384.6	-247.3	21.75	12.74	24.67	1110
30	30.66	11629.	7.255	-361.9	-222.1	22.60	12.81	25.74	1084
31	31.27	10633.	6.968	-338.4	-195.8	23.47	12.88	26.91	1057
32	31.94	9680.	6.671	-314.0	-168.3	24.34	12.94	28.15	1029
33	32.68	8765.	6.362	-288.5	-139.5	25.22	13.00	29.49	1000
34	33.49	7927.	6.048	-262.1	-109.4	26.12	13.04	30.88	971
35	34.40	7121.	5.724	-234.6	-77.8	27.04	13.09	32.40	941
36	35.40	6371.	5.395	-206.0	-44.6	27.98	13.14	34.02	911
37	36.52	5687.	5.064	-176.3	-9.7	28.93	13.18	35.73	880
38	37.78	5069.	4.733	-145.4	26.9	29.91	13.22	37.51	850
39	39.20	4523.	4.406	-113.4	65.3	30.90	13.25	39.32	821
40	40.78	4056.	4.087	-80.4	105.5	31.92	13.29	41.06	794
41	42.56	3660.	3.780	-46.6	147.4	32.96	13.33	42.70	768
42	44.53	3340.	3.488	-12.2	190.9	34.00	13.37	44.11	744
43	46.69	3093.	3.216	22.6	235.5	35.05	13.42	45.19	723
44	49.05	2917.	2.966	57.4	281.0	36.10	13.46	45.81	706
45	51.57	2801.	2.738	91.8	326.9	37.13	13.50	45.94	692
46	54.24	2738.	2.532	125.5	372.8	38.14	13.53	45.64	681
47	57.01	2718.	2.348	158.2	418.1	39.12	13.56	44.95	673
48	59.85	2734.	2.185	189.8	462.7	40.06	13.58	43.99	667
49	62.73	2778.	2.039	220.1	506.1	40.95	13.59	42.84	664
50	65.63	2844.	1.912	249.2	548.4	41.81	13.60	41.63	662
51	68.52	2927.	1.798	277.0	589.4	42.62	13.60	40.40	661
52	71.39	3022.	1.698	303.7	629.2	43.39	13.61	39.22	661
53	74.24	3126.	1.608	329.4	667.9	44.13	13.63	38.11	663
54	77.06	3237.	1.528	354.1	705.5	44.83	13.65	37.09	665
55	79.85	3353.	1.456	378.0	742.1	45.50	13.67	36.15	668
56	82.60	3472.	1.392	401.7	778.3	46.16	13.69	35.29	671
57	85.31	3594.	1.333	424.2	813.2	46.77	13.71	34.50	674
58	88.00	3717.	1.280	446.1	847.3	47.37	13.74	33.79	678
59	90.65	3840.	1.231	467.5	880.8	47.94	13.77	33.14	682
60	93.26	3965.	1.186	488.4	913.6	48.49	13.81	32.57	685
61	95.85	4089.	1.144	508.9	945.9	49.02	13.86	32.04	689
62	98.41	4213.	1.106	529.0	977.7	49.54	13.91	31.57	693
63	100.94	4337.	1.071	548.8	1009.1	50.04	13.96	31.15	697
64	103.44	4460.	1.038	568.4	1040.0	50.53	14.02	30.77	701
65	105.91	4583.	1.007	587.7	1070.6	51.01	14.09	30.43	705
66	108.37	4705.	0.978	606.8	1100.9	51.47	14.16	30.13	709
67	110.80	4826.	0.951	625.7	1130.9	51.92	14.24	29.85	713
68	113.20	4947.	0.925	644.4	1160.6	52.36	14.32	29.61	717
69	115.59	5067.	0.902	663.1	1190.1	52.79	14.41	29.40	721
70	117.96	5186.	0.879	681.6	1219.4	53.21	14.51	29.20	724
71	120.31	5304.	0.858	700.0	1248.5	53.62	14.60	29.04	728
72	122.64	5420.	0.837	718.3	1277.5	54.03	14.71	28.90	732
73	124.96	5536.	0.818	736.6	1306.3	54.43	14.81	28.77	735
74	127.25	5652.	0.800	754.8	1335.0	54.82	14.93	28.67	739
75	129.54	5766.	0.782	773.0	1363.7	55.20	15.04	28.58	742
76	131.81	5880.	0.766	791.2	1392.2	55.58	15.16	28.50	745
77	134.08	5995.	0.750	809.4	1420.8	55.95	15.29	28.44	749
78	136.32	6108.	0.735	827.6	1449.2	56.32	15.42	28.39	752
79	138.54	6220.	0.720	845.8	1477.5	56.68	15.55	28.35	755
80	140.76	6331.	0.706	864.0	1505.8	57.04	15.68	28.32	758
81	142.96	6441.	0.692	882.3	1534.1	57.39	15.82	28.31	761
82	145.15	6551.	0.680	900.6	1562.5	57.74	15.97	28.31	764
83	147.33	6660.	0.668	919.0	1590.8	58.08	16.11	28.33	767
84	149.50	6768.	0.656	937.5	1619.1	58.42	16.26	28.36	770
85	151.66	6876.	0.645	956.0	1647.5	58.75	16.42	28.40	773
86	153.82	6983.	0.634	974.6	1675.9	59.09	16.57	28.44	776
87	155.96	7090.	0.624	993.3	1704.4	59.42	16.73	28.49	779
88	158.10	7196.	0.614	1012.1	1732.9	59.74	16.89	28.55	782
89	160.22	7301.	0.604	1030.9	1761.5	60.06	17.05	28.62	785
90	162.34	7406.	0.595	1049.9	1790.2	60.39	17.21	28.69	788
91	164.46	7511.	0.586	1069.0	1818.9	60.70	17.38	28.77	791
92	166.56	7615.	0.577	1088.2	1847.7	61.02	17.54	28.85	793
93	168.66	7718.	0.569	1107.6	1876.6	61.33	17.71	28.94	796
94	170.75	7821.	0.560	1127.0	1905.6	61.64	17.88	29.03	799
95	172.84	7924.	0.553	1146.6	1934.7	61.95	18.05	29.13	802
96	174.92	8026.	0.545	1166.3	1963.8	62.25	18.22	29.22	804
97	177.00	8128.	0.537	1186.1	1993.1	62.56	18.39	29.33	807
98	179.06	8229.	0.530	1206.0	2022.5	62.86	18.55	29.43	810
99	181.13	8330.	0.523	1226.1	2052.0	63.16	18.72	29.54	813
100	183.19	8431.	0.516	1246.3	2081.6	63.45	18.89	29.65	815

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

50.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME $\bar{V}$ CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^{3}ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 15.402	25.30	29559.	9.567	-617.3	-489.2	10.24	10.00	13.09	1395
16	25.43	28594.	9.590	-610.0	-481.2	10.74	10.19	13.57	1383
17	25.66	27324.	9.581	-597.2	-467.2	11.59	10.50	14.31	1368
18	25.89	26057.	9.529	-583.7	-452.5	12.43	10.80	15.06	1351
19	26.14	24873.	9.448	-569.6	-437.1	13.26	11.07	15.79	1335
20	26.41	23679.	9.344	-554.8	-421.0	14.09	11.32	16.54	1318
21	26.70	22500.	9.224	-539.3	-404.1	14.92	11.56	17.29	1301
22	27.00	21333.	9.091	-523.2	-386.4	15.74	11.77	18.06	1283
23	27.32	20191.	8.939	-506.3	-367.9	16.56	11.96	18.84	1264
24	27.66	19057.	8.771	-488.8	-348.7	17.38	12.13	19.64	1245
25	28.02	17918.	8.587	-470.6	-328.7	18.19	12.28	20.47	1225
26	28.41	16801.	8.388	-451.7	-307.8	19.01	12.42	21.32	1204
27	28.83	15707.	8.172	-432.1	-286.0	19.83	12.54	22.21	1182
28	29.28	14650.	7.941	-411.7	-263.4	20.66	12.65	23.11	1160
29	29.76	13609.	7.696	-390.5	-239.8	21.49	12.74	24.07	1137
30	30.28	12603.	7.436	-368.6	-215.2	22.32	12.82	25.04	1112
31	30.84	11623.	7.164	-345.9	-189.7	23.16	12.89	26.08	1087
32	31.45	10679.	6.882	-322.4	-163.1	24.00	12.95	27.18	1C
33	32.12	9773.	6.591	-298.1	-135.4	24.85	13.01	28.34	1034
34	32.84	8936.	6.294	-272.8	-106.5	25.72	13.06	29.53	1008
35	33.64	8133.	5.991	-246.7	-76.3	26.59	13.10	30.81	980
36	34.51	7378.	5.683	-219.7	-44.8	27.48	13.14	32.16	953
37	35.47	6681.	5.371	-191.7	-12.0	28.38	13.18	33.55	925
38	36.54	6045.	5.061	-162.9	22.3	29.29	13.21	34.99	897
39	37.71	5472.	4.753	-133.1	58.0	30.22	13.24	36.44	870
40	39.01	4967.	4.451	-102.5	95.1	31.16	13.26	37.86	844
41	40.44	4527.	4.157	-71.2	133.7	32.11	13.29	39.23	820
42	42.02	4155.	3.875	-39.3	173.5	33.07	13.32	40.47	797
43	43.74	3845.	3.607	-7.0	214.5	34.04	13.36	41.56	775
44	45.60	3601.	3.355	25.5	256.5	35.00	13.39	42.38	757
45	47.61	3417.	3.121	57.9	299.1	35.96	13.43	42.88	741
46	49.74	3287.	2.907	90.2	342.2	36.91	13.47	43.10	727
47	51.97	3209.	2.710	121.9	385.3	37.83	13.51	43.02	716
48	54.30	3157.	2.531	153.0	428.1	38.74	13.54	42.65	707
49	56.70	3148.	2.370	183.3	470.5	39.61	13.57	42.05	700
50	59.14	3166.	2.225	212.6	512.2	40.45	13.59	41.29	695
51	61.61	3207.	2.095	241.0	553.1	41.26	13.61	40.44	692
52	64.10	3267.	1.977	268.4	593.1	42.04	13.63	39.53	690
53	66.58	3341.	1.872	294.8	632.2	42.78	13.65	38.61	689
54	69.06	3426.	1.777	320.4	670.3	43.50	13.67	37.72	689
55	71.52	3521.	1.692	345.2	707.6	44.18	13.69	36.88	690
56	73.97	3627.	1.615	369.8	744.6	44.85	13.72	36.07	692
57	76.40	3728.	1.545	393.2	780.2	45.48	13.74	35.32	694
58	78.81	3838.	1.481	415.9	815.2	46.09	13.77	34.62	696
59	81.19	3951.	1.422	438.1	849.5	46.67	13.80	33.98	699
60	83.55	4067.	1.369	459.9	883.1	47.24	13.84	33.39	702
61	85.89	4183.	1.319	481.1	916.3	47.78	13.89	32.86	705
62	88.20	4301.	1.274	502.0	948.9	48.32	13.94	32.37	709
63	90.49	4419.	1.231	522.5	981.0	48.83	13.99	31.92	712
64	92.76	4538.	1.192	542.8	1012.7	49.33	14.06	31.53	715
65	95.01	4657.	1.155	562.7	1044.1	49.81	14.12	31.16	719
66	97.24	4776.	1.121	582.4	1075.1	50.29	14.20	30.84	722
67	99.45	4895.	1.089	601.9	1105.7	50.75	14.28	30.54	725
68	101.64	5014.	1.059	621.2	1136.1	51.20	14.36	30.28	729
69	103.82	5132.	1.031	640.3	1166.3	51.64	14.45	30.04	732
70	105.97	5250.	1.004	659.4	1196.2	52.07	14.54	29.83	736
71	108.11	5366.	0.979	678.3	1226.0	52.49	14.64	29.65	739
72	110.24	5483.	0.955	697.1	1255.5	52.91	14.74	29.48	742
73	112.34	5598.	0.932	715.8	1284.9	53.31	14.85	29.34	745
74	114.44	5713.	0.911	734.4	1314.2	53.71	14.97	29.22	749
75	116.52	5827.	0.890	753.1	1343.4	54.10	15.08	29.11	752
76	118.58	5941.	0.871	771.6	1372.4	54.49	15.20	29.02	755
77	120.64	6055.	0.852	790.2	1401.4	54.87	15.33	28.95	758
78	122.68	6168.	0.835	808.8	1430.3	55.24	15.46	28.89	761
79	124.71	6280.	0.817	827.4	1459.2	55.61	15.59	28.84	764
80	126.73	6392.	0.801	845.9	1488.0	55.97	15.72	28.81	767
81	128.73	6504.	0.786	864.6	1516.8	56.33	15.86	28.79	770
82	130.73	6614.	0.771	883.2	1545.5	56.68	16.01	28.77	773
83	132.72	6725.	0.757	901.9	1574.3	57.03	16.15	28.77	776
84	134.69	6836.	0.743	920.7	1603.0	57.37	16.30	28.78	779
85	136.66	6939.	0.730	939.5	1631.8	57.71	16.45	28.80	781
86	138.62	7047.	0.717	958.4	1660.6	58.05	16.60	28.83	784
87	140.57	7154.	0.705	977.3	1689.5	58.38	16.76	28.86	787
88	142.51	7262.	0.693	996.3	1718.3	58.71	16.92	28.90	790
89	144.45	7368.	0.682	1015.5	1747.3	59.04	17.08	28.96	792
90	146.37	7474.	0.671	1034.7	1776.2	59.36	17.24	29.02	795
91	148.29	7580.	0.661	1054.0	1805.3	59.68	17.40	29.09	798
92	150.21	7685.	0.651	1073.4	1834.4	60.00	17.57	29.16	801
93	152.12	7789.	0.641	1093.0	1863.6	60.32	17.74	29.24	803
94	154.02	7893.	0.632	1112.6	1892.9	60.63	17.90	29.32	806
95	155.91	7997.	0.623	1132.4	1922.3	60.94	18.07	29.41	809
96	157.80	8100.	0.614	1152.3	1951.7	61.25	18.24	29.50	811
97	159.69	8203.	0.605	1172.3	1981.3	61.56	18.41	29.60	814
98	161.56	8305.	0.597	1192.4	2010.9	61.86	18.58	29.69	817
99	163.44	8407.	0.589	1212.7	2040.7	62.16	18.74	29.79	820
100	165.31	8509.	0.581	1233.0	2070.5	62.46	18.91	29.90	822

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

60.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 15.701	25.15	30691.	9.606	-615.8	-462.9	10.28	10.06	13.09	1416
16	25.21	30202.	9.634	-612.2	-458.9	10.53	10.16	13.33	1411
17	25.42	28867.	9.664	-599.8	-445.2	11.36	10.48	14.08	1396
18	25.65	27627.	9.637	-586.7	-430.8	12.19	10.78	14.81	1381
19	25.88	26486.	9.577	-572.9	-415.6	13.01	11.05	15.52	1367
20	26.13	25335.	9.491	-558.6	-399.7	13.82	11.31	16.22	1352
21	26.39	24150.	9.385	-543.6	-383.1	14.63	11.54	16.94	1335
22	26.67	23018.	9.265	-528.0	-365.9	15.44	11.75	17.66	1319
23	26.97	21877.	9.130	-511.8	-347.8	16.24	11.94	18.40	1302
24	27.28	20769.	8.977	-494.9	-329.1	17.04	12.12	19.14	1284
25	27.61	19659.	8.809	-477.4	-309.5	17.83	12.27	19.89	1266
26	27.96	18574.	8.626	-459.3	-289.3	18.63	12.41	20.66	1247
27	28.34	17508.	8.429	-440.5	-268.2	19.42	12.54	21.45	1227
28	28.74	16471.	8.218	-421.1	-246.4	20.22	12.65	22.26	1207
29	29.16	15455.	7.994	-401.0	-223.7	21.01	12.76	23.09	1186
30	29.62	14464.	7.757	-380.3	-200.2	21.81	12.84	23.93	1164
31	30.10	13510.	7.510	-358.9	-175.9	22.61	12.91	24.80	1142
32	30.62	12584.	7.254	-336.8	-150.6	23.41	12.98	25.70	1119
33	31.18	11697.	6.990	-314.1	-124.5	24.21	13.04	26.62	1096
34	31.79	10856.	6.720	-290.7	-97.4	25.02	13.09	27.57	1072
35	32.43	10055.	6.445	-266.6	-69.4	25.83	13.13	28.55	1048
36	33.14	9293.	6.168	-241.8	-40.3	26.65	13.17	29.57	1024
37	33.89	8579.	5.887	-216.3	-10.2	27.48	13.21	30.60	1000
38	34.71	7920.	5.607	-190.2	20.9	28.31	13.23	31.65	976
39	35.60	7310.	5.327	-163.4	53.0	29.14	13.25	32.69	952
40	36.56	6754.	5.052	-136.0	86.2	29.98	13.26	33.73	929
41	37.60	6255.	4.780	-108.1	120.5	30.83	13.28	34.74	907
42	38.72	5813.	4.517	-79.8	155.7	31.67	13.29	35.69	886
43	39.93	5427.	4.261	-51.0	191.8	32.52	13.32	36.58	865
44	41.23	5086.	4.017	-21.9	228.8	33.37	13.34	37.39	846
45	42.61	4803.	3.784	7.4	266.5	34.22	13.37	38.05	829
46	44.08	4572.	3.564	36.8	304.8	35.07	13.41	38.59	813
47	45.64	4384.	3.358	66.1	343.6	35.90	13.45	38.97	799
48	47.27	4238.	3.165	95.2	382.6	36.72	13.49	39.18	786
49	48.97	4131.	2.986	124.1	421.8	37.53	13.53	39.23	776
50	50.73	4059.	2.820	152.6	461.0	38.32	13.57	39.13	767
51	52.55	4015.	2.667	180.6	500.0	39.10	13.60	38.88	760
52	54.40	3997.	2.527	208.0	538.8	39.85	13.63	38.54	754
53	56.28	4002.	2.398	234.9	577.1	40.58	13.67	38.10	749
54	58.19	4026.	2.279	261.2	614.9	41.28	13.70	37.60	745
55	60.11	4066.	2.170	286.8	652.2	41.97	13.73	37.06	743
56	62.05	4119.	2.071	312.3	689.5	42.64	13.76	36.51	741
57	63.98	4183.	1.980	336.8	725.7	43.28	13.79	35.94	740
58	65.91	4257.	1.896	360.6	761.4	43.90	13.82	35.38	740
59	67.84	4338.	1.819	384.0	796.4	44.50	13.85	34.85	741
60	69.77	4425.	1.748	406.8	831.0	45.08	13.89	34.34	741
61	71.68	4518.	1.683	429.3	865.1	45.65	13.94	33.85	743
62	73.59	4615.	1.622	451.3	898.7	46.19	13.99	33.40	744
63	75.49	4715.	1.566	472.9	931.8	46.72	14.05	32.98	746
64	77.37	4817.	1.514	494.2	964.6	47.24	14.12	32.59	748
65	79.25	4922.	1.465	515.2	997.0	47.74	14.18	32.23	750
66	81.11	5029.	1.420	535.9	1029.0	48.23	14.26	31.90	752
67	82.96	5137.	1.377	556.4	1060.8	48.71	14.34	31.59	754
68	84.80	5246.	1.337	576.7	1092.2	49.17	14.42	31.32	757
69	86.63	5356.	1.300	596.8	1123.4	49.63	14.51	31.06	759
70	88.44	5467.	1.265	616.7	1154.4	50.07	14.61	30.84	762
71	90.25	5578.	1.231	636.4	1185.1	50.51	14.71	30.63	764
72	92.04	5688.	1.200	656.1	1215.6	50.94	14.81	30.45	767
73	93.82	5799.	1.170	675.6	1246.0	51.36	14.92	30.29	769
74	95.59	5910.	1.141	695.1	1276.2	51.77	15.04	30.14	772
75	97.35	6021.	1.115	714.4	1306.3	52.17	15.15	30.02	774
76	99.10	6133.	1.089	733.8	1336.2	52.57	15.28	29.90	777
77	100.84	6243.	1.065	753.0	1366.1	52.96	15.40	29.81	779
78	102.56	6354.	1.042	772.3	1395.8	53.34	15.53	29.73	782
79	104.28	6465.	1.020	791.5	1425.5	53.72	15.67	29.66	784
80	105.99	6576.	0.998	810.8	1455.2	54.09	15.80	29.61	787
81	107.69	6686.	0.978	830.0	1484.7	54.46	15.94	29.57	789
82	109.39	6796.	0.959	849.3	1514.3	54.82	16.09	29.54	792
83	111.07	6906.	0.940	868.6	1543.8	55.18	16.23	29.52	794
84	112.75	7015.	0.923	887.9	1573.3	55.53	16.38	29.51	797
85	114.41	7124.	0.906	907.3	1602.8	55.88	16.53	29.51	799
86	116.07	7232.	0.889	926.7	1632.3	56.23	16.69	29.52	802
87	117.73	7340.	0.873	946.2	1661.9	56.57	16.84	29.53	804
88	119.37	7447.	0.858	965.7	1691.4	56.91	17.00	29.56	807
89	121.01	7554.	0.844	985.3	1721.0	57.24	17.16	29.60	809
90	122.64	7661.	0.829	1005.0	1750.6	57.57	17.32	29.63	812
91	124.27	7767.	0.816	1024.8	1780.3	57.90	17.48	29.68	814
92	125.89	7872.	0.803	1044.6	1810.0	58.22	17.64	29.73	817
93	127.50	7976.	0.790	1064.6	1839.7	58.55	17.80	29.79	819
94	129.11	8081.	0.778	1084.6	1869.5	58.87	17.97	29.85	821
95	130.71	8184.	0.766	1104.8	1899.4	59.18	18.13	29.92	824
96	132.30	8288.	0.754	1125.0	1929.4	59.49	18.29	29.98	826
97	133.89	8383.	0.743	1145.4	1959.4	59.81	18.46	30.07	829
98	135.48	8487.	0.733	1165.8	1989.5	60.12	18.62	30.16	831
99	137.07	8590.	0.723	1186.4	2019.7	60.42	18.79	30.25	834
100	138.65	8693.	0.713	1207.1	2050.0	60.73	18.95	30.34	836

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

70.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 15.995	25.01	31786.	9.663	-614.1	-436.7	10.33	10.12	13.10	1438
16	25.01	31777.	9.664	-614.0	-436.6	10.33	10.12	13.10	1438
17	25.21	30345.	9.736	-601.9	-423.2	11.15	10.45	13.87	1423
18	25.42	29148.	9.736	-589.2	-408.9	11.96	10.75	14.58	1410
19	25.64	28046.	9.693	-575.9	-394.0	12.77	11.03	15.27	1397
20	25.87	26929.	9.624	-561.9	-378.4	13.57	11.29	15.95	1383
21	26.12	25746.	9.532	-547.3	-362.1	14.37	11.52	16.64	1367
22	26.38	24639.	9.423	-532.2	-345.1	15.16	11.73	17.32	1352
23	26.65	23507.	9.300	-516.5	-327.4	15.94	11.93	18.02	1336
24	26.94	22418.	9.163	-500.2	-309.1	16.72	12.10	18.71	1320
25	27.24	21337.	9.009	-483.3	-290.0	17.50	12.26	19.42	1303
26	27.57	20271.	8.840	-465.8	-270.3	18.28	12.41	20.12	1286
27	27.91	19227.	8.659	-447.7	-249.8	19.05	12.54	20.85	1268
28	28.27	18206.	8.464	-429.1	-228.6	19.82	12.66	21.58	1249
29	28.65	17209.	8.257	-409.8	-206.6	20.59	12.77	22.32	1230
30	29.05	16230.	8.040	-390.0	-184.0	21.36	12.85	23.07	1210
31	29.49	15299.	7.811	-369.6	-160.5	22.13	12.94	23.83	1190
32	29.94	14387.	7.575	-348.7	-136.3	22.90	13.01	24.60	1169
33	30.43	13516.	7.331	-327.1	-111.3	23.67	13.07	25.38	1149
34	30.95	12668.	7.082	-305.0	-85.5	24.43	13.12	26.19	1127
35	31.50	11869.	6.829	-282.4	-59.0	25.21	13.17	26.99	1106
36	32.09	11104.	6.572	-259.2	-31.5	25.98	13.21	27.82	1084
37	32.72	10380.	6.313	-235.4	-3.3	26.75	13.25	28.66	1062
38	33.39	9704.	6.056	-211.1	25.8	27.53	13.27	29.50	1041
39	34.11	9072.	5.797	-186.3	55.7	28.30	13.29	30.32	1020
40	34.88	8481.	5.540	-161.0	86.4	29.08	13.29	31.14	999
41	35.70	7943.	5.287	-135.3	117.9	29.86	13.31	31.94	979
42	36.58	7457.	5.039	-109.2	150.2	30.64	13.32	32.71	959
43	37.51	7016.	4.797	-82.8	183.3	31.42	13.34	33.44	940
44	38.50	6621.	4.562	-56.0	217.1	32.19	13.35	34.13	922
45	39.55	6272.	4.336	-29.0	251.5	32.97	13.37	34.76	905
46	40.66	5970.	4.119	-1.9	286.5	33.74	13.41	35.31	889
47	41.83	5709.	3.912	25.4	322.1	34.50	13.45	35.78	874
48	43.06	5490.	3.715	52.6	358.0	35.26	13.49	36.16	860
49	44.34	5306.	3.529	79.9	394.3	36.01	13.53	36.44	848
50	45.67	5159.	3.354	106.9	430.8	36.75	13.57	36.62	836
51	47.05	5042.	3.191	133.8	467.5	37.47	13.61	36.70	827
52	48.47	4955.	3.037	160.4	504.2	38.18	13.65	36.68	818
53	49.92	4894.	2.893	186.7	540.8	38.88	13.69	36.58	811
54	51.41	4856.	2.759	212.7	577.3	39.56	13.73	36.40	805
55	52.93	4838.	2.635	238.2	613.6	40.23	13.77	36.17	799
56	54.46	4837.	2.519	263.9	650.2	40.89	13.80	35.88	795
57	56.01	4853.	2.412	288.6	685.9	41.52	13.83	35.55	792
58	57.58	4882.	2.312	312.8	721.2	42.14	13.86	35.20	789
59	59.15	4922.	2.219	336.7	756.2	42.73	13.90	34.83	787
60	60.73	4974.	2.133	360.1	790.8	43.32	13.95	34.46	786
61	62.31	5033.	2.053	383.2	825.1	43.88	13.99	34.09	785
62	63.89	5101.	1.979	405.8	859.0	44.43	14.05	33.74	785
63	65.47	5175.	1.910	428.1	892.5	44.97	14.10	33.39	785
64	67.05	5254.	1.845	450.1	925.7	45.49	14.17	33.06	785
65	68.62	5338.	1.785	471.9	958.6	46.00	14.24	32.75	786
66	70.19	5425.	1.729	493.3	991.2	46.50	14.31	32.46	786
67	71.76	5516.	1.676	514.5	1023.5	46.99	14.39	32.19	787
68	73.32	5609.	1.626	535.5	1055.5	47.46	14.48	31.94	789
69	74.88	5705.	1.579	556.3	1087.3	47.93	14.57	31.71	790
70	76.42	5803.	1.535	576.9	1118.9	48.38	14.67	31.49	791
71	77.96	5903.	1.494	597.3	1150.3	48.83	14.77	31.29	793
72	79.50	6004.	1.454	617.7	1181.5	49.26	14.87	31.11	794
73	81.03	6106.	1.417	637.9	1212.5	49.69	14.99	30.96	796
74	82.55	6209.	1.382	658.0	1243.4	50.11	15.10	30.81	798
75	84.06	6312.	1.348	678.0	1274.2	50.52	15.22	30.68	800
76	85.56	6416.	1.316	697.9	1304.8	50.93	15.34	30.57	802
77	87.06	6521.	1.286	717.8	1335.3	51.33	15.47	30.47	803
78	88.55	6626.	1.257	737.6	1365.7	51.72	15.60	30.39	805
79	90.04	6732.	1.230	757.5	1396.1	52.11	15.74	30.31	807
80	91.52	6838.	1.203	777.3	1426.4	52.49	15.87	30.25	809
81	92.99	6944.	1.178	797.1	1456.6	52.86	16.02	30.21	811
82	94.45	7050.	1.154	816.9	1486.8	53.23	16.16	30.17	813
83	95.91	7156.	1.131	836.7	1516.9	53.60	16.31	30.14	815
84	97.36	7263.	1.109	856.5	1547.0	53.96	16.46	30.12	817
85	98.80	7369.	1.088	876.4	1577.1	54.32	16.61	30.11	819
86	100.24	7475.	1.067	896.3	1607.3	54.67	16.76	30.11	821
87	101.67	7581.	1.048	916.2	1637.4	55.02	16.92	30.12	824
88	103.10	7687.	1.029	936.3	1667.5	55.36	17.08	30.14	826
89	104.52	7792.	1.011	956.3	1697.6	55.70	17.24	30.16	828
90	105.93	7898.	0.993	976.5	1727.8	56.04	17.40	30.18	830
91	107.34	8003.	0.977	996.7	1758.0	56.37	17.56	30.22	832
92	108.74	8107.	0.960	1017.0	1788.2	56.70	17.72	30.26	834
93	110.14	8211.	0.945	1037.3	1818.5	57.03	17.89	30.31	836
94	111.53	8315.	0.929	1057.8	1848.8	57.35	18.05	30.36	838
95	112.92	8419.	0.915	1078.3	1879.2	57.67	18.22	30.42	841
96	114.30	8523.	0.901	1099.0	1909.7	57.99	18.38	30.48	843
97	115.68	8625.	0.887	1119.7	1940.2	58.31	18.55	30.54	845
98	117.05	8728.	0.873	1140.5	1970.8	58.62	18.71	30.60	847
99	118.42	8830.	0.861	1161.5	2001.4	58.93	18.88	30.68	849
100	119.79	8933.	0.848	1182.5	2032.1	59.24	19.04	30.75	852

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

80.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 16.283	24.87	32867.	9.729	-612.3	-410.7	10.37	10.17	13.11	1459
17	25.00	31776.	9.799	-603.8	-401.1	10.95	10.41	13.67	1448
18	25.20	30634.	9.827	-591.4	-387.1	11.75	10.72	14.37	1437
19	25.41	29556.	9.803	-578.4	-372.4	12.55	11.01	15.05	1425
20	25.63	28465.	9.746	-564.8	-357.0	13.33	11.26	15.71	1412
21	25.86	27295.	9.668	-550.6	-341.0	14.12	11.50	16.37	1398
22	26.11	26208.	9.570	-535.9	-324.3	14.90	11.72	17.02	1384
23	26.36	25078.	9.456	-520.6	-306.9	15.67	11.91	17.69	1368
24	26.63	24010.	9.331	-504.8	-288.9	16.43	12.09	18.34	1353
25	26.91	22945.	9.191	-488.4	-270.2	17.20	12.25	19.01	1337
26	27.21	21904.	9.035	-471.5	-250.9	17.95	12.40	19.67	1321
27	27.52	20879.	8.867	-454.0	-230.9	18.71	12.54	20.34	1305
28	27.85	19870.	8.686	-436.0	-210.2	19.46	12.66	21.02	1288
29	28.20	18888.	8.494	-417.5	-188.9	20.21	12.77	21.70	1270
30	28.57	17918.	8.291	-398.4	-166.8	20.96	12.87	22.38	1252
31	28.96	17007.	8.079	-378.8	-144.1	21.70	12.95	23.06	1234
32	29.37	16107.	7.858	-358.7	-120.7	22.44	13.03	23.75	1215
33	29.80	15250.	7.632	-338.2	-96.6	23.19	13.10	24.44	1196
34	30.26	14394.	7.399	-317.1	-71.8	23.93	13.15	25.15	1176
35	30.74	13597.	7.162	-295.5	-46.3	24.67	13.20	25.85	1157
36	31.25	12831.	6.922	-273.4	-20.1	25.40	13.25	26.55	1137
37	31.79	12100.	6.681	-250.9	6.8	26.14	13.29	27.26	1117
38	32.37	11415.	6.438	-228.0	34.4	26.88	13.31	27.96	1098
39	32.98	10766.	6.196	-204.6	62.7	27.61	13.33	28.66	1079
40	33.62	10153.	5.955	-180.8	91.7	28.35	13.34	29.34	1059
41	34.30	9586.	5.717	-156.7	121.4	29.08	13.35	30.02	1041
42	35.03	9066.	5.481	-132.2	151.7	29.81	13.36	30.66	1023
43	35.79	8590.	5.251	-107.4	182.7	30.54	13.37	31.28	1005
44	36.59	8156.	5.026	-82.4	214.2	31.26	13.39	31.88	988
45	37.44	7760.	4.807	-57.1	246.4	31.99	13.41	32.44	971
46	38.33	7406.	4.595	-31.6	279.1	32.71	13.44	32.96	955
47	39.26	7092.	4.391	-5.9	312.3	33.42	13.48	33.43	940
48	40.23	6817.	4.195	19.8	345.9	34.13	13.52	33.84	926
49	41.25	6575.	4.008	45.6	379.9	34.83	13.55	34.19	913
50	42.30	6368.	3.829	71.3	414.2	35.52	13.59	34.47	901
51	43.40	6192.	3.660	97.0	448.8	36.21	13.63	34.69	890
52	44.53	6047.	3.499	122.6	483.5	36.88	13.68	34.83	880
53	45.69	5929.	3.348	148.1	518.4	37.55	13.72	34.91	871
54	46.88	5837.	3.205	173.3	553.3	38.20	13.76	34.93	863
55	48.10	5767.	3.071	198.3	588.2	38.84	13.80	34.89	856
56	49.35	5715.	2.944	223.6	623.6	39.48	13.84	34.80	850
57	50.61	5682.	2.825	248.1	658.4	40.09	13.88	34.66	845
58	51.89	5666.	2.714	272.3	692.9	40.69	13.91	34.48	840
59	53.19	5665.	2.609	296.1	727.3	41.28	13.95	34.28	836
60	54.50	5677.	2.511	319.7	761.4	41.86	14.00	34.05	833
61	55.81	5700.	2.419	342.9	795.4	42.42	14.05	33.82	830
62	57.14	5734.	2.333	365.9	829.0	42.96	14.10	33.57	828
63	58.47	5777.	2.253	388.5	862.5	43.50	14.16	33.33	827
64	59.80	5829.	2.177	410.9	895.6	44.02	14.22	33.08	825
65	61.13	5887.	2.106	433.0	928.6	44.53	14.29	32.84	825
66	62.47	5950.	2.039	454.9	961.3	45.03	14.37	32.61	824
67	63.81	6019.	1.977	476.6	993.8	45.52	14.45	32.40	824
68	65.14	6092.	1.918	498.0	1026.1	46.00	14.53	32.19	824
69	66.48	6170.	1.862	519.3	1058.2	46.47	14.63	32.00	824
70	67.81	6251.	1.810	540.4	1090.0	46.93	14.72	31.82	824
71	69.14	6335.	1.761	561.3	1121.8	47.38	14.82	31.65	824
72	70.47	6422.	1.714	582.1	1153.3	47.82	14.93	31.50	825
73	71.79	6511.	1.669	602.8	1184.8	48.25	15.04	31.35	826
74	73.11	6603.	1.627	623.4	1216.1	48.68	15.16	31.23	827
75	74.42	6696.	1.587	644.0	1247.2	49.10	15.28	31.11	828
76	75.73	6790.	1.549	664.4	1278.3	49.51	15.40	31.01	829
77	77.04	6885.	1.513	684.8	1309.3	49.91	15.53	30.92	830
78	78.34	6981.	1.478	705.1	1340.1	50.31	15.66	30.85	831
79	79.64	7079.	1.445	725.4	1371.0	50.70	15.80	30.78	832
80	80.93	7177.	1.414	745.7	1401.7	51.09	15.94	30.72	834
81	82.22	7276.	1.384	765.9	1432.4	51.47	16.08	30.68	835
82	83.50	7376.	1.355	786.2	1463.1	51.85	16.23	30.64	837
83	84.78	7476.	1.327	806.5	1493.7	52.22	16.38	30.62	838
84	86.06	7577.	1.300	826.7	1524.3	52.59	16.53	30.60	840
85	87.32	7679.	1.275	847.0	1554.9	52.95	16.68	30.59	841
86	88.59	7780.	1.251	867.4	1585.5	53.30	16.84	30.59	843
87	89.85	7882.	1.227	887.8	1616.1	53.66	16.99	30.59	844
88	91.10	7984.	1.204	908.2	1646.6	54.01	17.15	30.60	846
89	92.35	8086.	1.183	928.7	1677.3	54.35	17.31	30.62	848
90	93.60	8189.	1.162	949.2	1707.9	54.70	17.48	30.65	850
91	94.84	8292.	1.142	969.8	1738.5	55.03	17.64	30.68	851
92	96.07	8394.	1.122	990.5	1769.2	55.37	17.80	30.71	853
93	97.30	8497.	1.104	1011.2	1800.0	55.70	17.97	30.76	855
94	98.53	8599.	1.085	1032.0	1830.7	56.03	18.13	30.80	857
95	99.75	8702.	1.068	1053.0	1861.5	56.36	18.30	30.85	859
96	100.97	8803.	1.051	1073.9	1892.4	56.68	18.47	30.90	861
97	102.19	8905.	1.034	1095.0	1923.4	57.00	18.63	30.97	862
98	103.40	9006.	1.019	1116.2	1954.3	57.32	18.80	31.03	864
99	104.60	9108.	1.003	1137.5	1985.4	57.63	18.96	31.09	866
100	105.81	9209.	0.988	1158.8	2016.5	57.95	19.13	31.16	868

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

90.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 16.566	24.74	33854.	9.806	-610.5	-384.9	10.42	10.22	13.13	1479
17	24.81	33147.	9.857	-605.4	-379.1	10.76	10.37	13.48	1472
18	25.00	32093.	9.911	-593.3	-365.3	11.55	10.69	14.18	1463
19	25.20	31026.	9.906	-580.6	-350.8	12.34	10.98	14.85	1452
20	25.41	29943.	9.863	-567.3	-335.6	13.11	11.24	15.49	1440
21	25.63	28801.	9.794	-553.5	-319.8	13.89	11.48	16.13	1426
22	25.85	27730.	9.708	-539.1	-303.3	14.65	11.70	16.76	1413
23	26.09	26610.	9.604	-524.2	-286.2	15.41	11.90	17.40	1398
24	26.35	25556.	9.485	-508.8	-268.5	16.16	12.08	18.02	1384
25	26.61	24507.	9.356	-492.9	-250.2	16.91	12.24	18.65	1370
26	26.89	23483.	9.214	-476.4	-231.2	17.66	12.40	19.28	1355
27	27.18	22473.	9.057	-459.5	-211.7	18.40	12.54	19.91	1339
28	27.48	21473.	8.888	-442.0	-191.4	19.13	12.67	20.55	1323
29	27.80	20505.	8.709	-424.1	-170.6	19.86	12.78	21.18	1307
30	28.14	19545.	8.519	-405.7	-149.1	20.59	12.88	21.82	1290
31	28.49	18646.	8.320	-386.8	-126.9	21.32	12.97	22.44	1273
32	28.86	17757.	8.114	-367.4	-104.2	22.04	13.05	23.07	1256
33	29.26	16907.	7.901	-347.6	-80.8	22.76	13.12	23.69	1238
34	29.67	16052.	7.682	-327.3	-56.8	23.48	13.18	24.33	1220
35	30.10	15253.	7.458	-306.6	-32.1	24.19	13.24	24.95	1202
36	30.55	14488.	7.232	-285.5	-6.9	24.90	13.28	25.58	1184
37	31.03	13753.	7.004	-264.0	19.0	25.61	13.33	26.20	1166
38	31.53	13060.	6.775	-242.0	45.5	26.32	13.36	26.81	1148
39	32.06	12399.	6.546	-219.7	72.6	27.02	13.37	27.41	1130
40	32.62	11773.	6.317	-197.1	100.4	27.72	13.39	28.00	1113
41	33.21	11185.	6.091	-174.2	128.6	28.42	13.40	28.59	1095
42	33.82	10638.	5.866	-150.9	157.5	29.12	13.41	29.15	1078
43	34.47	10136.	5.645	-127.4	186.9	29.81	13.42	29.70	1062
44	35.14	9673.	5.429	-103.6	216.9	30.50	13.44	30.22	1046
45	35.85	9240.	5.217	-79.6	247.4	31.18	13.45	30.72	1030
46	36.60	8847.	5.011	-55.4	278.4	31.87	13.49	31.21	1014
47	37.37	8492.	4.812	-31.0	309.8	32.54	13.52	31.65	1000
48	38.18	8174.	4.618	-6.5	341.6	33.21	13.56	32.05	986
49	39.02	7886.	4.432	18.0	373.9	33.88	13.59	32.42	972
50	39.89	7633.	4.253	42.7	406.4	34.54	13.63	32.74	960
51	40.79	7408.	4.082	67.3	439.3	35.19	13.67	33.01	948
52	41.72	7215.	3.919	91.9	472.4	35.83	13.71	33.23	937
53	42.68	7050.	3.763	116.5	505.7	36.46	13.76	33.40	927
54	43.66	6911.	3.615	141.0	539.1	37.09	13.80	33.52	918
55	44.67	6796.	3.474	165.4	572.7	37.71	13.85	33.59	910
56	45.70	6698.	3.340	190.1	606.8	38.32	13.89	33.62	903
57	46.75	6622.	3.214	214.1	640.5	38.92	13.92	33.61	896
58	47.82	6564.	3.094	238.0	674.1	39.50	13.96	33.56	891
59	48.91	6523.	2.981	261.6	707.6	40.07	14.00	33.48	885
60	50.01	6497.	2.873	285.0	741.0	40.64	14.05	33.37	881
61	51.12	6484.	2.773	308.2	774.3	41.19	14.10	33.25	877
62	52.24	6484.	2.678	331.1	807.5	41.73	14.16	33.11	873
63	53.37	6495.	2.588	353.8	840.5	42.25	14.22	32.96	870
64	54.51	6516.	2.503	376.3	873.4	42.77	14.28	32.81	867
65	55.65	6547.	2.423	398.6	906.1	43.28	14.35	32.64	865
66	56.80	6584.	2.347	420.7	938.7	43.78	14.42	32.48	863
67	57.95	6628.	2.276	442.6	971.1	44.26	14.50	32.33	862
68	59.11	6679.	2.209	464.3	1003.3	44.74	14.59	32.18	860
69	60.26	6736.	2.145	485.9	1035.4	45.21	14.68	32.03	859
70	61.42	6797.	2.085	507.3	1067.3	45.67	14.78	31.89	859
71	62.57	6863.	2.028	528.5	1099.2	46.12	14.88	31.76	858
72	63.73	6933.	1.974	549.7	1130.9	46.56	14.99	31.64	858
73	64.89	7007.	1.923	570.7	1162.4	47.00	15.10	31.53	858
74	66.04	7084.	1.874	591.7	1193.9	47.43	15.21	31.43	858
75	67.19	7164.	1.828	612.6	1225.3	47.85	15.33	31.34	858
76	68.35	7245.	1.784	633.4	1256.6	48.26	15.46	31.26	858
77	69.50	7328.	1.742	654.1	1287.8	48.67	15.59	31.19	858
78	70.64	7413.	1.702	674.8	1319.0	49.07	15.72	31.13	859
79	71.79	7501.	1.663	695.5	1350.1	49.47	15.86	31.08	860
80	72.93	7590.	1.627	716.1	1381.2	49.86	16.00	31.03	860
81	74.07	7679.	1.592	736.7	1412.2	50.25	16.14	31.00	861
82	75.20	7770.	1.558	757.4	1443.2	50.63	16.29	30.98	862
83	76.34	7863.	1.526	778.0	1474.1	51.00	16.44	30.96	863
84	77.47	7956.	1.495	798.7	1505.1	51.37	16.59	30.94	864
85	78.59	8051.	1.466	819.3	1536.0	51.74	16.75	30.94	865
86	79.71	8146.	1.437	840.0	1567.0	52.10	16.90	30.94	866
87	80.83	8242.	1.410	860.8	1597.9	52.46	17.06	30.95	867
88	81.95	8339.	1.384	881.5	1628.9	52.81	17.22	30.97	868
89	83.06	8436.	1.358	902.4	1659.8	53.16	17.38	30.99	869
90	84.17	8534.	1.334	923.3	1690.8	53.51	17.55	31.01	871
91	85.27	8633.	1.310	944.2	1721.8	53.85	17.71	31.05	872
92	86.38	8732.	1.287	965.2	1752.9	54.19	17.88	31.08	873
93	87.47	8832.	1.265	986.3	1784.0	54.53	18.04	31.12	875
94	88.57	8931.	1.244	1007.5	1815.1	54.86	18.21	31.17	876
95	89.66	9031.	1.224	1028.7	1846.3	55.19	18.38	31.21	878
96	90.75	9130.	1.204	1050.0	1877.6	55.52	18.54	31.26	880
97	91.83	9229.	1.185	1071.4	1908.9	55.84	18.71	31.32	881
98	92.91	9328.	1.166	1092.9	1940.2	56.16	18.88	31.38	883
99	93.99	9427.	1.148	1114.5	1971.6	56.48	19.04	31.44	884
100	95.06	9526.	1.131	1136.2	2003.1	56.80	19.21	31.50	886

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

100.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME $CM^3/GMOLE$	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 16.844	24.61	34738.	9.897	-608.5	-359.2	10.46	10.26	13.17	1497
17	24.64	34469.	9.915	-606.7	-357.1	10.58	10.32	13.30	1494
18	24.81	33531.	9.992	-594.9	-343.5	11.36	10.65	13.99	1488
19	25.00	32456.	10.004	-582.5	-329.2	12.13	10.95	14.66	1478
20	25.20	31383.	9.974	-569.5	-314.2	12.90	11.22	15.29	1467
21	25.41	30267.	9.915	-556.0	-298.6	13.66	11.46	15.92	1454
22	25.62	29207.	9.836	-541.9	-282.3	14.42	11.68	16.53	1441
23	25.85	28104.	9.742	-527.4	-265.5	15.17	11.88	17.14	1427
24	26.09	27059.	9.633	-512.4	-248.1	15.91	12.07	17.74	1414
25	26.33	26025.	9.510	-496.8	-230.0	16.65	12.23	18.34	1400
26	26.59	25014.	9.378	-480.8	-211.4	17.38	12.39	18.94	1386
27	26.86	24019.	9.233	-464.3	-192.1	18.10	12.53	19.54	1372
28	27.15	23026.	9.075	-447.4	-172.3	18.83	12.67	20.15	1357
29	27.44	22069.	8.906	-429.9	-151.8	19.54	12.79	20.74	1341
30	27.76	21118.	8.728	-412.0	-130.8	20.26	12.89	21.34	1326
31	28.08	20226.	8.541	-393.7	-109.2	20.97	12.99	21.92	1310
32	28.42	19345.	8.346	-375.0	-87.0	21.67	13.07	22.50	1294
33	28.78	18499.	8.145	-355.8	-64.2	22.37	13.15	23.08	1278
34	29.15	17649.	7.938	-336.2	-40.8	23.07	13.21	23.66	1260
35	29.54	16850.	7.726	-316.2	-16.8	23.76	13.27	24.23	1244
36	29.95	16085.	7.511	-295.8	7.7	24.45	13.32	24.80	1227
37	30.38	15348.	7.295	-275.1	32.8	25.14	13.36	25.36	1210
38	30.83	14648.	7.077	-254.0	58.4	25.83	13.40	25.91	1193
39	31.30	13980.	6.858	-232.6	84.6	26.51	13.42	26.44	1177
40	31.79	13344.	6.640	-210.9	111.3	27.18	13.43	26.97	1160
41	32.31	12741.	6.423	-188.9	138.5	27.85	13.44	27.49	1144
42	32.85	12176.	6.208	-166.6	166.2	28.52	13.46	27.99	1128
43	33.41	11649.	5.995	-144.0	194.5	29.19	13.47	28.48	1112
44	34.00	11163.	5.787	-121.3	223.2	29.85	13.49	28.94	1097
45	34.61	10702.	5.582	-98.3	252.4	30.50	13.50	29.40	1082
46	35.24	10279.	5.382	-75.1	282.0	31.16	13.54	29.85	1067
47	35.91	9891.	5.186	-51.8	312.1	31.80	13.57	30.27	1053
48	36.60	9539.	4.997	-28.3	342.6	32.44	13.61	30.66	1039
49	37.31	9215.	4.813	-4.7	373.4	33.08	13.64	31.02	1026
50	38.05	8923.	4.635	19.0	404.6	33.71	13.68	31.34	1014
51	38.81	8659.	4.464	42.8	436.0	34.33	13.72	31.64	1002
52	39.60	8425.	4.299	66.5	467.8	34.95	13.76	31.89	991
53	40.41	8219.	4.142	90.3	499.8	35.56	13.80	32.11	980
54	41.25	8041.	3.990	114.0	532.0	36.16	13.85	32.28	971
55	42.10	7886.	3.846	137.7	564.3	36.75	13.89	32.42	962
56	42.97	7756.	3.708	161.9	597.3	37.35	13.93	32.52	954
57	43.87	7635.	3.576	185.4	629.9	37.93	13.97	32.59	946
58	44.78	7539.	3.451	208.8	662.5	38.49	14.01	32.62	939
59	45.70	7463.	3.331	232.0	695.1	39.05	14.06	32.63	933
60	46.64	7407.	3.218	255.1	727.7	39.60	14.10	32.60	927
61	47.59	7354.	3.110	278.1	760.3	40.14	14.15	32.57	922
62	48.56	7321.	3.008	300.8	792.9	40.67	14.21	32.52	918
63	49.53	7308.	2.911	323.5	825.3	41.19	14.27	32.45	913
64	50.51	7297.	2.819	345.9	857.7	41.70	14.34	32.36	910
65	51.50	7295.	2.731	368.2	890.1	42.20	14.41	32.27	906
66	52.50	7305.	2.648	390.3	922.3	42.69	14.48	32.18	903
67	53.50	7324.	2.570	412.3	954.4	43.17	14.56	32.08	901
68	54.51	7357.	2.495	434.1	986.4	43.65	14.65	31.98	898
69	55.52	7386.	2.424	455.8	1018.4	44.11	14.74	31.88	896
70	56.53	7427.	2.357	477.4	1050.2	44.57	14.83	31.79	894
71	57.54	7473.	2.294	498.9	1081.9	45.02	14.93	31.70	893
72	58.56	7525.	2.233	520.2	1113.6	45.46	15.04	31.62	892
73	59.58	7581.	2.176	541.5	1145.2	45.90	15.15	31.54	891
74	60.60	7642.	2.120	562.6	1176.7	46.33	15.27	31.47	890
75	61.62	7707.	2.069	583.8	1208.1	46.75	15.39	31.41	889
76	62.64	7773.	2.019	604.8	1239.5	47.17	15.51	31.35	889
77	63.65	7843.	1.971	625.8	1270.8	47.58	15.64	31.30	888
78	64.67	7916.	1.926	646.8	1302.1	47.98	15.77	31.26	888
79	65.69	7991.	1.883	667.7	1333.3	48.38	15.91	31.23	888
80	66.71	8069.	1.841	688.6	1364.6	48.77	16.05	31.20	888
81	67.72	8148.	1.801	709.6	1395.8	49.16	16.20	31.19	888
82	68.73	8229.	1.763	730.5	1426.9	49.54	16.34	31.17	888
83	69.75	8312.	1.727	751.4	1458.1	49.92	16.50	31.17	889
84	70.76	8396.	1.692	772.3	1489.3	50.29	16.65	31.17	889
85	71.76	8483.	1.658	793.3	1520.5	50.66	16.80	31.18	889
86	72.77	8570.	1.626	814.3	1551.6	51.03	16.96	31.19	890
87	73.77	8659.	1.594	835.3	1582.8	51.39	17.12	31.21	891
88	74.77	8749.	1.565	856.4	1614.0	51.74	17.28	31.23	891
89	75.77	8840.	1.536	877.5	1645.3	52.10	17.45	31.26	892
90	76.77	8931.	1.508	898.7	1676.6	52.45	17.61	31.29	893
91	77.76	9025.	1.481	919.9	1707.9	52.79	17.78	31.33	894
92	78.75	9119.	1.455	941.3	1739.2	53.13	17.94	31.37	895
93	79.74	9214.	1.430	962.6	1770.6	53.47	18.11	31.41	896
94	80.72	9309.	1.406	984.1	1802.0	53.81	18.28	31.46	897
95	81.71	9405.	1.382	1005.6	1833.5	54.14	18.45	31.51	899
96	82.69	9500.	1.360	1027.2	1865.0	54.47	18.62	31.56	900
97	83.66	9595.	1.338	1048.9	1896.6	54.80	18.78	31.62	901
98	84.64	9691.	1.317	1070.6	1928.2	55.12	18.95	31.68	902
99	85.61	9787.	1.296	1092.5	1960.0	55.45	19.12	31.74	904
100	86.58	9883.	1.276	1114.5	1991.7	55.77	19.29	31.80	905

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

120.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 17.388	24.37	36787.	10.082	-604.4	-308.1	10.54	10.36	13.25	1538
18	24.47	36358.	10.139	-597.4	-299.9	11.01	10.57	13.65	1537
19	24.64	35218.	10.185	-585.5	-285.9	11.76	10.88	14.33	1526
20	24.82	34149.	10.182	-573.0	-271.3	12.51	11.16	14.95	1516
21	25.00	33101.	10.141	-560.1	-256.1	13.26	11.41	15.55	1505
22	25.20	32048.	10.078	-546.6	-240.2	13.99	11.64	16.13	1494
23	25.40	30991.	9.997	-532.7	-223.8	14.72	11.85	16.70	1482
24	25.62	29959.	9.903	-518.3	-206.8	15.45	12.04	17.26	1469
25	25.84	28950.	9.796	-503.4	-189.3	16.16	12.21	17.82	1457
26	26.07	27954.	9.677	-488.1	-171.2	16.87	12.37	18.37	1444
27	26.31	26982.	9.548	-472.4	-152.5	17.58	12.52	18.92	1431
28	26.56	26006.	9.409	-456.3	-133.3	18.27	12.67	19.48	1418
29	26.82	25063.	9.260	-439.7	-113.6	18.97	12.79	20.02	1404
30	27.09	24131.	9.100	-422.7	-93.3	19.66	12.90	20.56	1390
31	27.37	23241.	8.933	-405.3	-72.5	20.34	13.01	21.09	1376
32	27.67	22369.	8.757	-387.5	-51.1	21.02	13.10	21.61	1362
33	27.97	21522.	8.576	-369.3	-29.2	21.69	13.18	22.12	1347
34	28.29	20695.	8.388	-350.8	-6.8	22.36	13.26	22.63	1333
35	28.62	19895.	8.196	-332.0	16.0	23.02	13.32	23.13	1318
36	28.97	19133.	8.000	-312.8	39.4	23.68	13.38	23.62	1303
37	29.32	18393.	7.802	-293.3	63.3	24.33	13.43	24.10	1288
38	29.70	17683.	7.601	-273.5	87.6	24.98	13.47	24.56	1273
39	30.08	17003.	7.400	-253.4	112.4	25.63	13.49	25.01	1259
40	30.48	16358.	7.199	-233.0	137.6	26.26	13.51	25.45	1244
41	30.90	15734.	6.999	-212.4	163.3	26.90	13.53	25.88	1230
42	31.33	15147.	6.799	-191.6	189.4	27.53	13.55	26.30	1216
43	31.78	14581.	6.600	-170.5	215.9	28.15	13.57	26.72	1201
44	32.25	14058.	6.404	-149.3	242.8	28.77	13.59	27.11	1187
45	32.73	13559.	6.211	-127.8	270.1	29.38	13.61	27.50	1174
46	33.23	13091.	6.020	-106.2	297.9	30.00	13.64	27.89	1160
47	33.75	12654.	5.833	-84.4	326.0	30.60	13.68	28.26	1146
48	34.28	12250.	5.651	-62.4	354.4	31.20	13.71	28.61	1133
49	34.83	11871.	5.473	-40.3	383.2	31.79	13.75	28.95	1121
50	35.40	11523.	5.300	-18.1	412.3	32.38	13.78	29.26	1109
51	35.99	11196.	5.131	4.2	441.7	32.96	13.82	29.56	1097
52	36.59	10898.	4.967	26.5	471.4	33.54	13.86	29.83	1086
53	37.21	10629.	4.809	49.0	501.3	34.11	13.91	30.08	1075
54	37.84	10386.	4.656	71.4	531.5	34.67	13.95	30.30	1065
55	38.49	10167.	4.508	94.0	561.9	35.23	14.00	30.50	1055
56	39.15	9966.	4.366	117.0	593.0	35.79	14.04	30.67	1046
57	39.83	9786.	4.229	139.5	623.8	36.34	14.07	30.82	1038
58	40.52	9628.	4.097	161.9	654.7	36.87	14.12	30.94	1030
59	41.23	9490.	3.970	184.4	685.6	37.40	14.16	31.04	1023
60	41.94	9370.	3.849	206.7	716.7	37.93	14.21	31.12	1016
61	42.67	9261.	3.732	229.0	747.9	38.44	14.26	31.19	1009
62	43.41	9170.	3.620	251.3	779.1	38.95	14.32	31.24	1003
63	44.16	9093.	3.514	273.4	810.4	39.45	14.38	31.28	997
64	44.92	9030.	3.411	295.5	841.7	39.94	14.45	31.31	992
65	45.69	8980.	3.313	317.5	873.0	40.43	14.52	31.32	987
66	46.46	8940.	3.219	339.4	904.3	40.91	14.59	31.33	982
67	47.24	8911.	3.130	361.2	935.6	41.38	14.67	31.33	978
68	48.03	8891.	3.044	383.0	967.0	41.84	14.76	31.32	974
69	48.82	8882.	2.962	404.7	998.3	42.30	14.85	31.31	970
70	49.62	8881.	2.884	426.3	1029.6	42.75	14.94	31.29	967
71	50.42	8886.	2.809	447.8	1060.9	43.19	15.04	31.28	964
72	51.22	8898.	2.737	469.3	1092.1	43.63	15.15	31.27	961
73	52.03	8918.	2.669	490.7	1123.4	44.06	15.26	31.26	958
74	52.84	8944.	2.604	512.1	1154.6	44.49	15.37	31.24	956
75	53.66	8976.	2.541	533.4	1185.9	44.90	15.49	31.23	954
76	54.47	9011.	2.481	554.7	1217.1	45.32	15.61	31.23	952
77	55.29	9052.	2.424	576.0	1248.3	45.73	15.74	31.23	950
78	56.11	9097.	2.369	597.3	1279.5	46.13	15.87	31.23	948
79	56.93	9146.	2.317	618.5	1310.7	46.53	16.01	31.23	947
80	57.75	9199.	2.266	639.8	1342.0	46.92	16.15	31.25	946
81	58.57	9255.	2.218	661.0	1373.2	47.31	16.30	31.26	945
82	59.39	9314.	2.172	682.3	1404.5	47.69	16.44	31.29	944
83	60.22	9376.	2.127	703.6	1435.8	48.07	16.59	31.31	943
84	61.04	9440.	2.084	724.9	1467.1	48.45	16.75	31.34	942
85	61.86	9507.	2.043	746.3	1498.5	48.82	16.90	31.38	942
86	62.69	9576.	2.003	767.7	1529.9	49.18	17.06	31.41	941
87	63.51	9647.	1.965	789.1	1561.3	49.55	17.22	31.46	941
88	64.33	9720.	1.928	810.6	1592.8	49.91	17.39	31.50	941
89	65.15	9795.	1.893	832.2	1624.3	50.26	17.55	31.55	941
90	65.97	9872.	1.858	853.8	1655.9	50.62	17.72	31.60	941
91	66.79	9950.	1.825	875.4	1687.5	50.97	17.89	31.65	941
92	67.60	10030.	1.793	897.2	1719.2	51.31	18.06	31.71	941
93	68.42	10111.	1.762	919.0	1750.9	51.66	18.22	31.77	941
94	69.24	10194.	1.732	940.9	1782.7	52.00	18.39	31.83	942
95	70.05	10279.	1.703	962.9	1814.6	52.33	18.57	31.90	942
96	70.86	10363.	1.675	984.9	1846.5	52.67	18.74	31.96	943
97	71.67	10448.	1.648	1007.0	1878.5	53.00	18.91	32.03	943
98	72.48	10534.	1.622	1029.3	1910.6	53.33	19.08	32.10	944
99	73.29	10621.	1.596	1051.6	1942.7	53.65	19.25	32.17	945
100	74.10	10709.	1.571	1074.0	1974.9	53.98	19.42	32.24	945

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

140.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME $CM^3/GMOLE$	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 17.916	24.14	39197.	10.248	-600.0	-257.6	10.62	10.45	13.28	1583
18	24.15	39161.	10.258	-599.1	-256.5	10.68	10.48	13.34	1583
19	24.31	37863.	10.337	-587.7	-242.8	11.42	10.81	14.02	1571
20	24.47	36809.	10.359	-575.7	-228.5	12.16	11.11	14.64	1562
21	24.65	35818.	10.347	-563.2	-213.6	12.89	11.37	15.23	1553
22	24.83	34764.	10.299	-550.2	-198.0	13.61	11.60	15.79	1542
23	25.01	33760.	10.230	-536.8	-182.0	14.32	11.82	16.34	1532
24	25.20	32739.	10.147	-522.9	-165.4	15.03	12.01	16.87	1520
25	25.40	31746.	10.053	-508.6	-148.2	15.73	12.19	17.39	1509
26	25.61	30759.	9.947	-493.9	-130.6	16.42	12.36	17.91	1497
27	25.83	29801.	9.831	-478.8	-112.4	17.11	12.51	18.43	1485
28	26.05	28841.	9.704	-463.3	-93.7	17.79	12.66	18.95	1473
29	26.29	27911.	9.570	-447.4	-74.5	18.46	12.79	19.46	1461
30	26.53	27000.	9.426	-431.1	-54.8	19.13	12.91	19.95	1448
31	26.78	26097.	9.274	-414.5	-34.6	19.79	13.02	20.45	1435
32	27.04	25229.	9.115	-397.5	-13.9	20.45	13.12	20.93	1422
33	27.31	24377.	8.948	-380.1	7.3	21.10	13.21	21.40	1409
34	27.58	23579.	8.777	-362.4	28.9	21.74	13.29	21.86	1396
35	27.87	22779.	8.600	-344.4	51.0	22.38	13.37	22.31	1382
36	28.17	22015.	8.420	-326.1	73.5	23.02	13.43	22.75	1369
37	28.48	21277.	8.236	-307.5	96.5	23.65	13.49	23.18	1356
38	28.80	20557.	8.050	-288.7	119.9	24.27	13.53	23.60	1342
39	29.13	19871.	7.863	-269.6	143.7	24.89	13.56	23.99	1329
40	29.47	19221.	7.675	-250.2	167.8	25.50	13.59	24.37	1317
41	29.82	18586.	7.486	-230.7	192.4	26.11	13.61	24.75	1303
42	30.19	17978.	7.299	-210.9	217.3	26.71	13.63	25.12	1291
43	30.56	17391.	7.112	-190.9	242.7	27.31	13.65	25.49	1278
44	30.95	16838.	6.927	-170.8	268.3	27.90	13.68	25.85	1265
45	31.35	16315.	6.744	-150.4	294.4	28.48	13.70	26.19	1252
46	31.77	15818.	6.562	-129.9	320.8	29.06	13.74	26.54	1239
47	32.19	15347.	6.383	-109.2	347.5	29.64	13.77	26.87	1227
48	32.63	14905.	6.208	-88.3	374.5	30.21	13.81	27.20	1215
49	33.08	14489.	6.035	-67.4	401.8	30.77	13.85	27.50	1203
50	33.54	14100.	5.865	-46.3	429.5	31.33	13.89	27.79	1191
51	34.01	13729.	5.701	-25.1	457.4	31.88	13.93	28.08	1179
52	34.50	13385.	5.539	-3.7	485.7	32.43	13.97	28.34	1168
53	35.00	13067.	5.383	17.7	514.1	32.97	14.01	28.60	1158
54	35.51	12773.	5.231	39.1	542.9	33.51	14.06	28.84	1148
55	36.03	12505.	5.083	60.7	571.8	34.04	14.10	29.05	1138
56	36.57	12252.	4.939	82.8	601.5	34.58	14.14	29.25	1129
57	37.11	12022.	4.800	104.4	630.8	35.10	14.18	29.43	1120
58	37.66	11813.	4.666	126.0	660.3	35.61	14.22	29.58	1111
59	38.23	11624.	4.536	147.7	690.0	36.12	14.27	29.73	1103
60	38.80	11454.	4.410	169.3	719.8	36.62	14.31	29.86	1096
61	39.39	11297.	4.289	190.9	749.7	37.11	14.37	29.98	1088
62	39.98	11157.	4.171	212.5	779.7	37.60	14.42	30.09	1081
63	40.58	11032.	4.059	234.1	809.8	38.08	14.49	30.19	1075
64	41.19	10923.	3.950	255.7	840.1	38.56	14.55	30.28	1069
65	41.81	10827.	3.846	277.3	870.4	39.03	14.62	30.35	1063
66	42.44	10747.	3.745	298.8	900.8	39.49	14.70	30.42	1057
67	43.07	10669.	3.648	320.3	931.2	39.95	14.78	30.49	1052
68	43.70	10607.	3.555	341.8	961.7	40.40	14.86	30.54	1047
69	44.35	10557.	3.465	363.2	992.3	40.85	14.95	30.59	1042
70	45.00	10517.	3.379	384.6	1022.9	41.29	15.05	30.64	1037
71	45.65	10482.	3.296	406.0	1053.6	41.72	15.15	30.68	1033
72	46.31	10457.	3.216	427.4	1084.3	42.15	15.25	30.73	1029
73	46.97	10440.	3.140	448.8	1115.0	42.58	15.36	30.77	1025
74	47.63	10431.	3.066	470.1	1145.8	42.99	15.47	30.80	1022
75	48.30	10429.	2.995	491.5	1176.6	43.41	15.59	30.85	1018
76	48.97	10434.	2.927	512.8	1207.5	43.82	15.71	30.88	1015
77	49.64	10445.	2.862	534.1	1238.4	44.22	15.84	30.92	1012
78	50.32	10461.	2.799	555.5	1269.3	44.62	15.97	30.96	1010
79	51.00	10483.	2.739	576.8	1300.3	45.01	16.11	31.01	1007
80	51.68	10510.	2.681	598.2	1331.3	45.40	16.25	31.05	1005
81	52.36	10542.	2.625	619.6	1362.4	45.79	16.39	31.10	1003
82	53.04	10577.	2.572	641.0	1393.5	46.17	16.54	31.15	1001
83	53.73	10617.	2.520	662.5	1424.7	46.55	16.68	31.20	999
84	54.41	10660.	2.470	684.0	1455.9	46.92	16.84	31.26	997
85	55.10	10706.	2.422	705.6	1487.2	47.29	16.99	31.32	996
86	55.79	10755.	2.376	727.2	1518.5	47.66	17.15	31.38	995
87	56.47	10807.	2.331	748.8	1549.9	48.02	17.31	31.45	993
88	57.16	10861.	2.288	770.5	1581.4	48.38	17.47	31.52	992
89	57.85	10918.	2.247	792.3	1613.0	48.74	17.64	31.59	991
90	58.54	10978.	2.206	814.2	1644.6	49.09	17.81	31.66	991
91	59.23	11037.	2.168	836.1	1676.3	49.44	17.97	31.74	990
92	59.92	11099.	2.130	858.1	1708.1	49.79	18.14	31.82	989
93	60.61	11163.	2.093	880.2	1740.0	50.14	18.31	31.90	989
94	61.30	11230.	2.058	902.4	1771.9	50.48	18.48	31.99	988
95	61.99	11299.	2.024	924.7	1803.9	50.82	18.66	32.07	988
96	62.67	11370.	1.991	947.0	1836.1	51.15	18.83	32.15	988
97	63.36	11442.	1.959	969.4	1868.3	51.49	19.00	32.24	988
98	64.05	11515.	1.928	992.0	1900.5	51.82	19.17	32.32	988
99	64.73	11591.	1.898	1014.6	1932.9	52.15	19.34	32.41	988
100	65.42	11667.	1.869	1037.3	1965.3	52.47	19.52	32.49	988

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

160.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME $CM^3/GMOLE$	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 18.431	23.93	41276.	10.460	-595.5	-207.6	10.69	10.54	13.38	1622
19	24.01	40423.	10.491	-589.1	-199.8	11.11	10.74	13.76	1614
20	24.16	39417.	10.522	-577.5	-185.8	11.83	11.05	14.37	1605
21	24.32	38434.	10.521	-565.4	-171.1	12.54	11.32	14.95	1597
22	24.49	37389.	10.493	-552.9	-155.9	13.25	11.56	15.50	1587
23	24.66	36428.	10.442	-539.9	-140.1	13.95	11.78	16.03	1578
24	24.84	35417.	10.369	-526.5	-123.8	14.65	11.98	16.54	1567
25	25.02	34435.	10.285	-512.7	-107.1	15.33	12.17	17.04	1557
26	25.21	33451.	10.189	-498.5	-89.8	16.01	12.34	17.53	1546
27	25.41	32503.	10.085	-483.9	-72.0	16.68	12.50	18.03	1535
28	25.61	31560.	9.972	-468.9	-53.7	17.34	12.65	18.51	1524
29	25.82	30638.	9.848	-453.6	-35.0	18.00	12.79	18.99	1512
30	26.04	29744.	9.717	-437.9	-15.7	18.65	12.91	19.46	1501
31	26.27	28830.	9.578	-421.9	4.0	19.30	13.03	19.93	1489
32	26.50	27967.	9.432	-405.5	24.1	19.94	13.14	20.38	1477
33	26.74	27110.	9.279	-388.8	44.7	20.57	13.24	20.83	1464
34	26.99	26331.	9.120	-371.8	65.7	21.20	13.32	21.25	1453
35	27.24	25533.	8.956	-354.5	87.2	21.82	13.40	21.67	1441
36	27.51	24766.	8.788	-336.9	109.1	22.44	13.47	22.08	1428
37	27.78	24027.	8.617	-319.0	131.4	23.05	13.53	22.48	1416
38	28.06	23301.	8.443	-300.9	154.0	23.66	13.58	22.86	1404
39	28.35	22611.	8.268	-282.6	177.1	24.25	13.62	23.22	1392
40	28.65	21952.	8.091	-264.0	200.5	24.85	13.65	23.57	1380
41	28.96	21310.	7.913	-245.2	224.2	25.43	13.67	23.91	1368
42	29.27	20693.	7.736	-226.3	248.3	26.01	13.70	24.24	1357
43	29.60	20089.	7.558	-207.1	272.7	26.59	13.73	24.58	1345
44	29.93	19515.	7.381	-187.8	297.4	27.16	13.75	24.90	1333
45	30.28	18975.	7.206	-168.3	322.5	27.72	13.78	25.22	1321
46	30.63	18460.	7.033	-148.6	347.9	28.28	13.82	25.54	1309
47	30.99	17962.	6.862	-128.8	373.6	28.83	13.86	25.85	1298
48	31.36	17491.	6.692	-108.8	399.6	29.38	13.90	26.15	1286
49	31.74	17048.	6.525	-88.7	425.9	29.92	13.94	26.44	1275
50	32.13	16630.	6.361	-68.5	452.5	30.46	13.98	26.71	1264
51	32.53	16227.	6.201	-48.1	479.3	30.99	14.03	26.98	1253
52	32.94	15848.	6.042	-27.6	506.4	31.52	14.07	27.24	1242
53	33.36	15493.	5.887	-7.1	533.8	32.04	14.11	27.48	1231
54	33.79	15162.	5.737	13.6	561.4	32.55	14.16	27.72	1221
55	34.22	14853.	5.590	34.4	589.2	33.06	14.20	27.94	1212
56	34.67	14560.	5.447	55.7	617.8	33.58	14.24	28.14	1202
57	35.12	14289.	5.307	76.6	646.0	34.08	14.28	28.33	1193
58	35.59	14038.	5.172	97.5	674.4	34.57	14.32	28.51	1185
59	36.06	13807.	5.041	118.5	703.0	35.06	14.37	28.67	1177
60	36.53	13596.	4.913	139.5	731.8	35.55	14.42	28.82	1169
61	37.02	13397.	4.789	160.5	760.7	36.02	14.47	28.97	1161
62	37.51	13216.	4.669	181.5	789.7	36.50	14.53	29.11	1154
63	38.02	13051.	4.553	202.6	818.9	36.96	14.59	29.24	1147
64	38.52	12902.	4.440	223.7	848.2	37.42	14.66	29.36	1140
65	39.04	12768.	4.331	244.7	877.6	37.88	14.73	29.47	1133
66	39.56	12642.	4.226	265.8	907.1	38.33	14.80	29.59	1127
67	40.08	12530.	4.124	286.9	936.8	38.78	14.88	29.69	1121
68	40.61	12431.	4.026	308.1	966.5	39.22	14.97	29.79	1115
69	41.15	12344.	3.931	329.2	996.3	39.65	15.06	29.88	1110
70	41.69	12269.	3.839	350.3	1026.3	40.08	15.15	29.96	1104
71	42.24	12199.	3.751	371.5	1056.3	40.51	15.25	30.05	1099
72	42.79	12139.	3.665	392.7	1086.4	40.93	15.36	30.14	1094
73	43.34	12088.	3.582	413.8	1116.5	41.35	15.46	30.22	1090
74	43.90	12046.	3.503	435.0	1146.8	41.76	15.58	30.30	1085
75	44.46	12013.	3.426	456.3	1177.1	42.16	15.69	30.37	1081
76	45.03	11987.	3.352	477.5	1207.5	42.57	15.82	30.45	1077
77	45.60	11969.	3.280	498.8	1238.0	42.97	15.94	30.52	1073
78	46.17	11957.	3.211	520.1	1268.6	43.36	16.07	30.60	1070
79	46.74	11953.	3.144	541.4	1299.2	43.75	16.20	30.67	1066
80	47.32	11954.	3.080	562.8	1329.9	44.14	16.34	30.74	1063
81	47.89	11960.	3.018	584.2	1360.6	44.52	16.48	30.82	1060
82	48.47	11972.	2.958	605.6	1391.5	44.90	16.63	30.90	1057
83	49.06	11988.	2.900	627.1	1422.4	45.27	16.78	30.97	1055
84	49.64	12010.	2.844	648.7	1453.4	45.64	16.93	31.05	1052
85	50.22	12036.	2.790	670.3	1484.5	46.01	17.08	31.13	1050
86	50.81	12064.	2.738	692.0	1515.7	46.38	17.24	31.22	1048
87	51.39	12095.	2.688	713.8	1546.9	46.74	17.40	31.30	1046
88	51.98	12131.	2.640	735.6	1578.3	47.10	17.56	31.40	1044
89	52.57	12170.	2.592	757.5	1609.7	47.45	17.72	31.48	1042
90	53.16	12212.	2.547	779.5	1641.3	47.80	17.89	31.58	1041
91	53.75	12251.	2.503	801.5	1672.9	48.15	18.05	31.68	1039
92	54.34	12294.	2.461	823.7	1704.6	48.50	18.22	31.78	1038
93	54.93	12340.	2.419	845.9	1736.5	48.84	18.39	31.88	1037
94	55.52	12389.	2.379	868.3	1768.4	49.18	18.56	31.98	1036
95	56.12	12441.	2.341	890.7	1800.4	49.52	18.73	32.08	1035
96	56.71	12496.	2.303	913.2	1832.6	49.86	18.90	32.18	1034
97	57.30	12554.	2.267	935.8	1864.8	50.19	19.08	32.28	1033
98	57.89	12614.	2.231	958.5	1897.1	50.53	19.25	32.39	1033
99	58.49	12675.	2.197	981.4	1929.6	50.86	19.42	32.49	1032
100	59.08	12739.	2.164	1004.3	1962.1	51.18	19.59	32.59	1032

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

180.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 18.933	23.73	43024.	10.680	-590.7	-158.0	10.77	10.64	13.51	1657
19	23.74	42905.	10.679	-590.0	-157.0	10.81	10.67	13.55	1655
20	23.88	42002.	10.692	-578.7	-143.2	11.52	10.99	14.13	1648
21	24.03	40960.	10.692	-567.0	-128.8	12.23	11.27	14.70	1639
22	24.18	39921.	10.671	-554.8	-113.8	12.92	11.52	15.24	1629
23	24.34	39001.	10.629	-542.2	-98.3	13.61	11.75	15.75	1621
24	24.50	38007.	10.570	-529.2	-82.3	14.29	11.96	16.25	1611
25	24.67	37033.	10.495	-515.8	-65.8	14.97	12.15	16.73	1601
26	24.85	36049.	10.408	-502.1	-48.8	15.63	12.32	17.21	1591
27	25.03	35106.	10.314	-487.9	-31.4	16.29	12.49	17.68	1581
28	25.22	34181.	10.210	-473.4	-13.5	16.94	12.64	18.15	1570
29	25.41	33263.	10.099	-458.6	4.9	17.59	12.79	18.60	1560
30	25.61	32384.	9.980	-443.4	23.7	18.23	12.91	19.05	1549
31	25.82	31464.	9.851	-427.8	43.0	18.86	13.04	19.49	1538
32	26.03	30595.	9.716	-412.0	62.7	19.48	13.15	19.93	1526
33	26.25	29749.	9.576	-395.8	82.8	20.10	13.25	20.35	1515
34	26.47	28973.	9.429	-379.4	103.4	20.72	13.35	20.75	1505
35	26.70	28179.	9.276	-362.7	124.3	21.32	13.43	21.15	1493
36	26.94	27407.	9.118	-345.7	145.7	21.92	13.51	21.54	1482
37	27.18	26667.	8.957	-328.4	167.4	22.52	13.57	21.91	1471
38	27.44	25935.	8.793	-310.9	189.5	23.11	13.63	22.27	1459
39	27.70	25243.	8.628	-293.2	211.9	23.69	13.67	22.61	1449
40	27.96	24570.	8.460	-275.3	234.7	24.27	13.70	22.93	1438
41	28.23	23924.	8.292	-257.1	257.8	24.84	13.73	23.25	1427
42	28.51	23301.	8.123	-238.8	281.2	25.40	13.76	23.56	1416
43	28.80	22687.	7.954	-220.4	304.9	25.96	13.79	23.87	1405
44	29.10	22098.	7.785	-201.7	328.9	26.51	13.82	24.18	1394
45	29.40	21546.	7.618	-182.9	353.3	27.06	13.85	24.47	1383
46	29.71	21017.	7.450	-163.9	377.9	27.60	13.90	24.76	1372
47	30.02	20500.	7.285	-144.8	402.8	28.14	13.94	25.05	1361
48	30.35	20008.	7.122	-125.5	428.0	28.67	13.98	25.34	1350
49	30.68	19543.	6.961	-106.1	453.5	29.19	14.03	25.61	1339
50	31.02	19102.	6.802	-86.5	479.2	29.71	14.07	25.87	1329
51	31.36	18675.	6.645	-66.8	505.2	30.23	14.11	26.13	1318
52	31.72	18270.	6.490	-47.0	531.5	30.74	14.16	26.38	1308
53	32.08	17888.	6.339	-27.1	557.9	31.24	14.20	26.62	1298
54	32.45	17527.	6.191	-7.1	584.7	31.74	14.25	26.84	1288
55	32.82	17187.	6.045	13.0	611.6	32.24	14.30	27.06	1279
56	33.20	16862.	5.902	33.7	639.3	32.74	14.34	27.26	1269
57	33.59	16559.	5.764	54.0	666.6	33.22	14.38	27.45	1261
58	33.99	16273.	5.629	74.3	694.2	33.70	14.42	27.64	1252
59	34.39	16008.	5.496	94.7	721.9	34.17	14.47	27.81	1244
60	34.80	15762.	5.368	115.1	749.8	34.64	14.52	27.98	1236
61	35.21	15528.	5.243	135.6	777.9	35.11	14.57	28.14	1228
62	35.64	15312.	5.121	156.1	806.1	35.57	14.63	28.29	1220
63	36.06	15112.	5.003	176.7	834.4	36.02	14.69	28.44	1213
64	36.50	14929.	4.888	197.3	862.9	36.47	14.76	28.58	1205
65	36.94	14761.	4.776	217.9	891.6	36.91	14.83	28.72	1199
66	37.38	14599.	4.668	238.6	920.4	37.35	14.90	28.85	1192
67	37.83	14453.	4.563	259.3	949.3	37.79	14.98	28.98	1185
68	38.28	14321.	4.461	280.1	978.3	38.22	15.07	29.10	1179
69	38.74	14201.	4.362	300.9	1007.5	38.64	15.16	29.22	1173
70	39.21	14094.	4.266	321.7	1036.8	39.06	15.25	29.33	1167
71	39.67	13992.	4.174	342.6	1066.2	39.48	15.35	29.45	1162
72	40.15	13901.	4.084	363.5	1095.7	39.89	15.45	29.56	1156
73	40.62	13821.	3.997	384.4	1125.3	40.30	15.56	29.67	1151
74	41.10	13749.	3.913	405.4	1155.0	40.71	15.68	29.78	1146
75	41.58	13688.	3.831	426.5	1184.9	41.11	15.79	29.88	1141
76	42.07	13632.	3.752	447.5	1214.8	41.50	15.91	29.99	1136
77	42.56	13586.	3.675	468.7	1244.8	41.90	16.04	30.09	1132
78	43.05	13547.	3.602	489.8	1275.0	42.28	16.17	30.19	1128
79	43.54	13517.	3.530	511.1	1305.2	42.67	16.30	30.29	1124
80	44.04	13493.	3.461	532.4	1335.5	43.05	16.44	30.39	1120
81	44.54	13473.	3.393	553.7	1366.0	43.43	16.58	30.49	1116
82	45.04	13460.	3.328	575.1	1396.5	43.80	16.72	30.59	1112
83	45.54	13454.	3.265	596.6	1427.1	44.18	16.87	30.69	1109
84	46.04	13453.	3.205	618.1	1457.9	44.54	17.02	30.79	1106
85	46.55	13458.	3.145	639.7	1488.7	44.91	17.17	30.89	1103
86	47.05	13465.	3.089	661.4	1519.6	45.27	17.32	30.99	1100
87	47.56	13477.	3.033	683.2	1550.7	45.63	17.48	31.09	1098
88	48.07	13493.	2.980	705.0	1581.8	45.99	17.64	31.20	1095
89	48.58	13514.	2.928	727.0	1613.1	46.34	17.80	31.31	1093
90	49.10	13538.	2.878	749.0	1644.5	46.69	17.97	31.41	1091
91	49.61	13568.	2.829	771.1	1675.9	47.04	18.13	31.53	1089
92	50.12	13585.	2.782	793.3	1707.5	47.38	18.30	31.64	1087
93	50.64	13614.	2.737	815.6	1739.2	47.72	18.47	31.76	1085
94	51.16	13644.	2.692	838.1	1771.0	48.07	18.64	31.87	1083
95	51.67	13681.	2.649	860.6	1803.0	48.40	18.81	31.99	1082
96	52.19	13720.	2.608	883.2	1835.0	48.74	18.98	32.11	1080
97	52.71	13767.	2.567	905.9	1867.2	49.07	19.15	32.22	1079
98	53.22	13807.	2.528	928.7	1899.5	49.40	19.32	32.34	1078
99	53.74	13855.	2.490	951.6	1931.8	49.73	19.49	32.45	1077
100	54.26	13905.	2.453	974.7	1964.3	50.06	19.66	32.57	1076

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

200.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 19.423	23.54	45057.	10.878	-585.8	-108.7	10.84	10.76	13.62	1693
20	23.62	44615.	10.866	-579.4	-100.8	11.24	10.94	13.93	1690
21	23.76	43405.	10.857	-568.0	-86.6	11.93	11.23	14.49	1678
22	23.90	42396.	10.840	-556.2	-71.8	12.62	11.49	15.02	1669
23	24.05	41484.	10.805	-543.9	-56.5	13.30	11.72	15.51	1661
24	24.20	40517.	10.754	-531.3	-40.8	13.97	11.93	16.00	1652
25	24.36	39544.	10.690	-518.2	-24.5	14.63	12.13	16.47	1643
26	24.52	38567.	10.611	-504.8	-7.8	15.29	12.30	16.93	1633
27	24.69	37625.	10.521	-491.1	9.3	15.93	12.47	17.38	1623
28	24.86	36716.	10.426	-477.0	26.9	16.57	12.63	17.83	1614
29	25.04	35807.	10.324	-462.5	45.0	17.21	12.78	18.27	1604
30	25.23	34931.	10.215	-447.8	63.4	17.83	12.91	18.69	1594
31	25.42	34019.	10.097	-432.7	82.3	18.45	13.04	19.12	1583
32	25.61	33150.	9.974	-417.3	101.7	19.07	13.16	19.54	1573
33	25.81	32315.	9.842	-401.6	121.4	19.67	13.27	19.94	1563
34	26.01	31523.	9.705	-385.6	141.5	20.27	13.36	20.33	1553
35	26.23	30735.	9.564	-369.4	162.1	20.87	13.45	20.71	1542
36	26.44	29955.	9.416	-352.9	183.0	21.46	13.54	21.08	1531
37	26.67	29217.	9.265	-336.1	204.2	22.04	13.61	21.44	1521
38	26.89	28475.	9.109	-319.2	225.8	22.62	13.67	21.78	1510
39	27.13	27787.	8.952	-302.0	247.8	23.19	13.71	22.10	1500
40	27.37	27099.	8.793	-284.6	270.0	23.75	13.75	22.42	1490
41	27.61	26441.	8.632	-267.0	292.6	24.31	13.79	22.72	1480
42	27.87	25813.	8.471	-249.2	315.5	24.86	13.82	23.01	1470
43	28.12	25195.	8.309	-231.3	338.6	25.40	13.86	23.30	1459
44	28.39	24598.	8.148	-213.2	362.0	25.94	13.89	23.59	1449
45	28.66	24036.	7.987	-195.0	385.8	26.47	13.92	23.86	1439
46	28.93	23496.	7.826	-176.5	409.8	27.01	13.97	24.14	1429
47	29.21	22964.	7.667	-158.0	434.1	27.53	14.01	24.42	1418
48	29.50	22455.	7.509	-139.3	458.6	28.04	14.06	24.69	1408
49	29.80	21973.	7.352	-120.4	483.4	28.56	14.11	24.95	1398
50	30.10	21516.	7.198	-101.4	508.5	29.06	14.15	25.20	1388
51	30.40	21071.	7.045	-82.3	533.8	29.56	14.20	25.45	1378
52	30.71	20646.	6.894	-63.1	559.4	30.06	14.24	25.69	1368
53	31.03	20247.	6.746	-43.7	585.2	30.55	14.29	25.92	1358
54	31.36	19859.	6.600	-24.2	611.2	31.04	14.34	26.14	1349
55	31.69	19494.	6.457	-4.7	637.4	31.52	14.39	26.35	1340
56	32.02	19144.	6.316	15.5	664.4	32.01	14.43	26.56	1331
57	32.36	18813.	6.179	35.2	691.0	32.48	14.47	26.74	1322
58	32.71	18500.	6.044	55.1	717.9	32.94	14.51	26.93	1313
59	33.06	18207.	5.912	74.9	744.9	33.41	14.56	27.10	1305
60	33.42	17933.	5.783	94.9	772.0	33.86	14.61	27.27	1297
61	33.78	17669.	5.658	114.9	799.4	34.31	14.66	27.44	1289
62	34.15	17421.	5.536	134.9	826.9	34.76	14.72	27.61	1281
63	34.52	17193.	5.416	155.1	854.6	35.20	14.78	27.76	1274
64	34.90	16979.	5.300	175.2	882.4	35.64	14.85	27.92	1267
65	35.28	16780.	5.187	195.5	910.4	36.08	14.92	28.07	1259
66	35.67	16589.	5.076	215.8	938.6	36.51	15.00	28.21	1252
67	36.06	16411.	4.969	236.1	966.9	36.93	15.08	28.36	1246
68	36.46	16249.	4.864	256.5	995.3	37.35	15.16	28.50	1239
69	36.85	16099.	4.763	277.0	1023.9	37.77	15.25	28.64	1232
70	37.26	15962.	4.665	297.5	1052.6	38.18	15.35	28.77	1226
71	37.67	15834.	4.569	318.1	1081.4	38.59	15.45	28.90	1220
72	38.08	15716.	4.476	338.7	1110.4	39.00	15.55	29.03	1214
73	38.49	15608.	4.385	359.4	1139.5	39.40	15.66	29.16	1209
74	38.91	15511.	4.297	380.2	1168.7	39.80	15.77	29.29	1203
75	39.33	15423.	4.212	401.0	1198.1	40.19	15.89	29.41	1198
76	39.76	15341.	4.130	421.9	1227.5	40.58	16.01	29.54	1193
77	40.18	15268.	4.049	442.8	1257.1	40.97	16.13	29.66	1188
78	40.61	15204.	3.971	463.9	1286.9	41.35	16.26	29.78	1183
79	41.04	15148.	3.896	484.9	1316.7	41.73	16.39	29.90	1178
80	41.48	15100.	3.822	506.1	1346.7	42.11	16.53	30.02	1174
81	41.91	15055.	3.751	527.3	1376.7	42.48	16.67	30.15	1170
82	42.35	15017.	3.682	548.7	1407.0	42.85	16.81	30.27	1166
83	42.79	14987.	3.615	570.0	1437.3	43.22	16.96	30.39	1162
84	43.24	14964.	3.549	591.5	1467.7	43.59	17.11	30.50	1158
85	43.68	14948.	3.486	613.1	1498.3	43.95	17.26	30.62	1155
86	44.13	14934.	3.425	634.7	1529.0	44.31	17.41	30.74	1151
87	44.57	14926.	3.365	656.5	1559.8	44.66	17.57	30.86	1148
88	45.02	14923.	3.308	678.3	1590.7	45.02	17.73	30.98	1145
89	45.47	14925.	3.252	700.2	1621.7	45.37	17.89	31.10	1142
90	45.92	14937.	3.198	722.2	1652.9	45.71	18.05	31.22	1139
91	46.38	14939.	3.145	744.4	1684.2	46.06	18.22	31.34	1137
92	46.83	14948.	3.094	766.6	1715.6	46.40	18.38	31.47	1134
93	47.28	14962.	3.044	788.9	1747.1	46.74	18.55	31.59	1132
94	47.74	14978.	2.996	811.3	1778.7	47.08	18.71	31.72	1130
95	48.20	14998.	2.949	833.9	1810.5	47.42	18.88	31.85	1128
96	48.65	15021.	2.903	856.5	1842.4	47.75	19.05	31.97	1126
97	49.11	15048.	2.859	879.3	1874.5	48.08	19.22	32.10	1124
98	49.57	15078.	2.816	902.1	1906.6	48.41	19.39	32.23	1122
99	50.03	15111.	2.775	925.1	1938.9	48.74	19.56	32.35	1121
100	50.49	15147.	2.734	948.2	1971.3	49.07	19.73	32.48	1119

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

220.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME $CM^3/GMOLE$	$(\partial P/\partial\rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 19.903	23.36	47373.	11.163	-580.7	-60.0	10.90	10.89	13.79	1736
20	23.37	47317.	11.141	-579.6	-58.6	10.96	10.92	13.82	1735
21	23.51	45785.	11.014	-568.5	-44.5	11.65	11.19	14.30	1715
22	23.64	44823.	10.991	-557.0	-29.9	12.33	11.45	14.81	1707
23	23.78	43885.	10.965	-545.0	-14.9	13.00	11.69	15.30	1699
24	23.92	42936.	10.922	-532.7	0.7	13.66	11.91	15.77	1691
25	24.07	41976.	10.866	-520.0	16.7	14.32	12.11	16.23	1682
26	24.23	41012.	10.798	-506.9	33.1	14.96	12.29	16.68	1673
27	24.38	40070.	10.720	-493.5	50.0	15.60	12.46	17.13	1664
28	24.54	39176.	10.628	-479.7	67.4	16.23	12.63	17.55	1655
29	24.71	38266.	10.529	-465.7	85.1	16.85	12.78	17.97	1645
30	24.88	37396.	10.428	-451.3	103.3	17.47	12.91	18.38	1636
31	25.05	36508.	10.320	-436.6	121.9	18.08	13.04	18.80	1626
32	25.23	35646.	10.206	-421.6	140.9	18.68	13.17	19.20	1616
33	25.42	34819.	10.084	-406.3	160.3	19.28	13.28	19.59	1607
34	25.61	33996.	9.956	-390.8	180.1	19.87	13.38	19.97	1597
35	25.80	33211.	9.823	-375.0	200.2	20.45	13.48	20.33	1587
36	26.00	32425.	9.685	-358.9	220.7	21.03	13.56	20.70	1577
37	26.21	31677.	9.543	-342.6	241.6	21.60	13.64	21.04	1567
38	26.42	30938.	9.397	-326.0	262.8	22.17	13.70	21.37	1557
39	26.63	30241.	9.247	-309.3	284.3	22.73	13.75	21.68	1548
40	26.85	29534.	9.095	-292.4	306.2	23.28	13.80	21.98	1538
41	27.07	28877.	8.942	-275.2	328.3	23.83	13.84	22.27	1528
42	27.30	28241.	8.787	-258.0	350.7	24.37	13.87	22.55	1519
43	27.54	27625.	8.632	-240.5	373.4	24.90	13.91	22.82	1509
44	27.78	27024.	8.477	-222.9	396.3	25.43	13.95	23.09	1500
45	28.02	26451.	8.321	-205.1	419.5	25.95	13.98	23.35	1490
46	28.27	25902.	8.167	-187.2	443.0	26.47	14.03	23.63	1480
47	28.53	25360.	8.013	-169.1	466.8	26.98	14.08	23.89	1471
48	28.78	24838.	7.860	-150.8	490.8	27.48	14.13	24.15	1461
49	29.05	24343.	7.708	-132.5	515.1	27.99	14.18	24.40	1451
50	29.32	23868.	7.558	-114.0	539.6	28.48	14.23	24.65	1442
51	29.59	23409.	7.409	-95.3	564.4	28.97	14.27	24.89	1432
52	29.87	22971.	7.262	-76.6	589.3	29.46	14.32	25.12	1423
53	30.16	22551.	7.117	-57.7	614.6	29.94	14.37	25.34	1414
54	30.45	22150.	6.974	-38.7	640.0	30.41	14.42	25.56	1405
55	30.74	21767.	6.833	-19.6	665.7	30.88	14.47	25.77	1396
56	31.04	21396.	6.694	0.2	692.1	31.36	14.52	25.97	1387
57	31.34	21043.	6.558	19.4	718.1	31.82	14.56	26.15	1378
58	31.65	20708.	6.424	38.8	744.4	32.28	14.60	26.34	1370
59	31.96	20392.	6.294	58.3	770.8	32.73	14.65	26.51	1362
60	32.28	20092.	6.165	77.8	797.4	33.18	14.70	26.68	1354
61	32.60	19802.	6.040	97.4	824.2	33.62	14.75	26.86	1346
62	32.93	19529.	5.918	117.0	851.1	34.06	14.81	27.03	1338
63	33.26	19273.	5.798	136.8	878.2	34.49	14.87	27.19	1331
64	33.59	19036.	5.682	156.6	905.4	34.92	14.94	27.35	1323
65	33.93	18810.	5.567	176.4	932.9	35.34	15.01	27.51	1316
66	34.28	18591.	5.455	196.4	960.5	35.77	15.09	27.67	1309
67	34.62	18388.	5.347	216.4	988.2	36.18	15.17	27.82	1302
68	34.97	18198.	5.241	236.5	1016.1	36.60	15.26	27.97	1295
69	35.33	18021.	5.137	256.6	1044.1	37.00	15.35	28.12	1288
70	35.68	17858.	5.036	276.9	1072.3	37.41	15.44	28.27	1282
71	36.05	17704.	4.938	297.2	1100.7	37.81	15.54	28.41	1276
72	36.41	17562.	4.842	317.5	1129.1	38.21	15.64	28.55	1269
73	36.78	17431.	4.750	338.0	1157.8	38.61	15.75	28.70	1263
74	37.15	17309.	4.659	358.5	1186.5	39.00	15.86	28.84	1258
75	37.52	17199.	4.571	379.1	1215.4	39.39	15.98	28.98	1252
76	37.89	17091.	4.485	399.8	1244.5	39.77	16.10	29.12	1246
77	38.27	16994.	4.402	420.5	1273.7	40.15	16.23	29.26	1241
78	38.65	16905.	4.321	441.4	1303.0	40.53	16.35	29.39	1236
79	39.04	16827.	4.242	462.3	1332.5	40.91	16.49	29.53	1231
80	39.42	16756.	4.165	483.3	1362.1	41.28	16.62	29.67	1226
81	39.81	16686.	4.091	504.4	1391.8	41.65	16.76	29.81	1221
82	40.20	16625.	4.018	525.6	1421.7	42.01	16.90	29.94	1217
83	40.59	16571.	3.948	546.9	1451.7	42.38	17.05	30.08	1212
84	40.98	16526.	3.879	568.3	1481.8	42.74	17.20	30.22	1208
85	41.38	16488.	3.813	589.7	1512.1	43.10	17.35	30.35	1204
86	41.78	16453.	3.748	611.3	1542.5	43.45	17.50	30.48	1200
87	42.17	16425.	3.685	633.0	1573.1	43.81	17.66	30.62	1196
88	42.57	16404.	3.623	654.7	1603.8	44.16	17.82	30.75	1193
89	42.97	16387.	3.564	676.6	1634.6	44.50	17.98	30.88	1190
90	43.38	16377.	3.506	698.6	1665.5	44.85	18.14	31.01	1186
91	43.78	16369.	3.450	720.7	1696.6	45.19	18.30	31.15	1183
92	44.18	16366.	3.395	742.9	1727.8	45.53	18.46	31.28	1180
93	44.59	16365.	3.341	765.2	1759.1	45.87	18.63	31.41	1178
94	45.00	16368.	3.290	787.6	1790.6	46.21	18.80	31.55	1175
95	45.40	16375.	3.239	810.1	1822.2	46.54	18.96	31.68	1173
96	45.81	16387.	3.190	832.8	1854.0	46.88	19.13	31.81	1170
97	46.22	16393.	3.143	855.5	1885.9	47.21	19.30	31.95	1168
98	46.63	16408.	3.096	878.4	1917.9	47.54	19.47	32.08	1166
99	47.04	16427.	3.052	901.4	1950.0	47.86	19.63	32.22	1164
100	47.45	16449.	3.008	924.5	1982.3	48.19	19.80	32.35	1162

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

240.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME $CM^3/GMOLE$	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
• 20.373	23.19	49287.	11.284	-575.5	-11.5	10.96	11.04	13.90	1767
21	23.27	48094.	11.218	-568.6	-2.6	11.39	11.18	14.20	1752
22	23.40	47219.	11.138	-557.3	11.8	12.06	11.42	14.63	1743
23	23.53	46208.	11.107	-545.6	26.7	12.72	11.66	15.11	1735
24	23.67	45280.	11.074	-533.6	42.0	13.38	11.88	15.57	1727
25	23.81	44333.	11.026	-521.1	57.8	14.02	12.09	16.02	1719
26	23.95	43392.	10.966	-508.4	74.1	14.66	12.27	16.46	1710
27	24.10	42452.	10.897	-495.3	90.7	15.29	12.45	16.89	1702
28	24.25	41568.	10.816	-481.8	107.8	15.91	12.62	17.31	1693
29	24.40	40661.	10.728	-468.1	125.3	16.52	12.77	17.72	1684
30	24.56	39783.	10.629	-454.0	143.3	17.13	12.91	18.12	1675
31	24.73	38935.	10.525	-439.7	161.6	17.73	13.04	18.51	1666
32	24.89	38085.	10.419	-425.1	180.3	18.33	13.17	18.90	1657
33	25.06	37259.	10.306	-410.1	199.4	18.91	13.29	19.28	1648
34	25.24	36406.	10.186	-395.0	218.8	19.49	13.39	19.65	1638
35	25.42	35620.	10.060	-379.5	238.7	20.07	13.49	20.01	1629
36	25.61	34831.	9.930	-363.8	258.9	20.64	13.58	20.35	1620
37	25.80	34074.	9.795	-347.9	279.4	21.20	13.67	20.69	1610
38	25.99	33335.	9.658	-331.8	300.2	21.76	13.74	21.01	1601
39	26.19	32632.	9.517	-315.4	321.4	22.31	13.79	21.31	1592
40	26.39	31914.	9.372	-298.9	342.9	22.85	13.84	21.60	1583
41	26.60	31244.	9.224	-282.2	364.6	23.39	13.88	21.88	1573
42	26.81	30600.	9.076	-265.3	386.6	23.92	13.92	22.15	1564
43	27.02	29985.	8.927	-248.2	408.9	24.44	13.96	22.42	1555
44	27.24	29384.	8.777	-231.0	431.4	24.96	14.00	22.68	1546
45	27.46	28800.	8.628	-213.7	454.2	25.47	14.04	22.93	1537
46	27.69	28240.	8.478	-196.1	477.3	25.98	14.09	23.19	1528
47	27.92	27692.	8.329	-178.5	500.6	26.48	14.14	23.45	1519
48	28.16	27162.	8.181	-160.6	524.2	26.98	14.19	23.70	1510
49	28.40	26651.	8.033	-142.7	548.0	27.47	14.24	23.94	1500
50	28.65	26163.	7.887	-124.6	572.1	27.96	14.29	24.18	1491
51	28.90	25691.	7.742	-106.4	596.3	28.44	14.34	24.41	1482
52	29.15	25240.	7.599	-88.0	620.9	28.91	14.39	24.64	1474
53	29.41	24807.	7.457	-69.5	645.6	29.38	14.45	24.86	1465
54	29.67	24393.	7.317	-50.9	670.6	29.85	14.50	25.07	1456
55	29.94	23997.	7.179	-32.2	695.7	30.31	14.55	25.28	1448
56	30.21	23609.	7.043	-12.9	721.6	30.78	14.60	25.47	1439
57	30.48	23239.	6.908	6.0	747.2	31.23	14.64	25.66	1431
58	30.76	22887.	6.776	25.0	772.9	31.68	14.68	25.84	1423
59	31.04	22552.	6.646	44.0	798.9	32.12	14.73	26.01	1415
60	31.33	22233.	6.518	63.2	825.0	32.56	14.78	26.18	1407
61	31.62	21921.	6.393	82.4	851.2	33.00	14.84	26.36	1399
62	31.91	21626.	6.271	101.7	877.7	33.43	14.90	26.53	1391
63	32.21	21347.	6.151	121.1	904.3	33.85	14.96	26.69	1384
64	32.51	21085.	6.034	140.6	931.0	34.27	15.03	26.86	1376
65	32.81	20838.	5.919	160.1	958.0	34.69	15.10	27.02	1369
66	33.12	20596.	5.808	179.7	985.1	35.10	15.17	27.19	1362
67	33.43	20369.	5.699	199.4	1012.3	35.51	15.26	27.35	1355
68	33.74	20156.	5.592	219.2	1039.7	35.92	15.34	27.51	1348
69	34.06	19954.	5.487	239.1	1067.3	36.32	15.43	27.67	1341
70	34.38	19767.	5.385	259.0	1095.1	36.72	15.53	27.83	1334
71	34.70	19591.	5.286	279.1	1123.0	37.12	15.63	27.98	1328
72	35.03	19426.	5.188	299.2	1151.0	37.51	15.73	28.13	1321
73	35.36	19272.	5.093	319.4	1179.2	37.90	15.84	28.28	1315
74	35.69	19130.	5.000	339.7	1207.6	38.28	15.95	28.43	1309
75	36.02	18998.	4.910	360.1	1236.1	38.67	16.07	28.58	1303
76	36.36	18868.	4.821	380.5	1264.7	39.05	16.19	28.73	1297
77	36.70	18748.	4.736	401.1	1293.5	39.42	16.31	28.88	1292
78	37.04	18637.	4.652	421.8	1322.5	39.80	16.44	29.03	1286
79	37.38	18537.	4.571	442.5	1351.6	40.17	16.57	29.18	1281
80	37.73	18445.	4.491	463.4	1380.9	40.54	16.71	29.33	1276
81	38.08	18353.	4.414	484.3	1410.3	40.90	16.85	29.48	1270
82	38.43	18270.	4.338	505.4	1439.9	41.26	16.99	29.63	1265
83	38.78	18195.	4.265	526.5	1469.6	41.62	17.14	29.78	1261
84	39.13	18128.	4.194	547.8	1499.4	41.98	17.28	29.93	1256
85	39.49	18068.	4.124	569.2	1529.4	42.34	17.44	30.08	1252
86	39.84	18014.	4.057	590.6	1559.6	42.69	17.59	30.23	1247
87	40.20	17967.	3.991	612.2	1589.8	43.04	17.74	30.37	1243
88	40.56	17926.	3.926	633.9	1620.3	43.39	17.90	30.52	1239
89	40.92	17891.	3.864	655.7	1650.8	43.73	18.06	30.66	1236
90	41.28	17863.	3.803	677.6	1681.6	44.08	18.22	30.80	1232
91	41.65	17842.	3.743	699.7	1712.4	44.42	18.38	30.94	1229
92	42.01	17825.	3.686	721.8	1743.4	44.76	18.55	31.08	1225
93	42.38	17812.	3.629	744.1	1774.6	45.09	18.71	31.22	1222
94	42.74	17803.	3.574	766.5	1805.9	45.43	18.88	31.36	1219
95	43.11	17797.	3.521	789.0	1837.3	45.76	19.04	31.50	1216
96	43.48	17789.	3.469	811.6	1868.9	46.09	19.21	31.65	1214
97	43.85	17785.	3.418	834.3	1900.6	46.42	19.38	31.79	1211
98	44.22	17786.	3.368	857.2	1932.5	46.75	19.54	31.93	1208
99	44.59	17790.	3.320	880.2	1964.5	47.07	19.71	32.07	1206
100	44.96	17798.	3.273	903.3	1996.6	47.39	19.88	32.21	1204

• TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

260.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME $CM^3/GMOLE$	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 20.834	23.04	50716.	11.337	-570.1	36.8	11.03	11.14	13.98	1788
21	23.06	50341.	11.332	-568.3	39.1	11.14	11.18	14.07	1784
22	23.18	49599.	11.285	-557.2	53.3	11.81	11.41	14.48	1779
23	23.30	48451.	11.243	-545.8	68.1	12.46	11.64	14.94	1768
24	23.43	47543.	11.216	-534.0	83.3	13.11	11.86	15.39	1761
25	23.56	46620.	11.176	-521.8	98.9	13.74	12.07	15.83	1753
26	23.70	45713.	11.122	-509.3	114.9	14.37	12.26	16.26	1746
27	23.83	44775.	11.058	-496.5	131.4	14.99	12.44	16.68	1737
28	23.98	43897.	10.987	-483.4	148.3	15.61	12.61	17.09	1729
29	24.12	42995.	10.907	-469.9	165.6	16.22	12.76	17.49	1721
30	24.27	42103.	10.818	-456.2	183.3	16.82	12.91	17.88	1712
31	24.42	41295.	10.722	-442.1	201.3	17.41	13.04	18.26	1705
32	24.58	40461.	10.619	-427.8	219.8	17.99	13.17	18.63	1696
33	24.74	39630.	10.513	-413.2	238.6	18.57	13.29	19.00	1687
34	24.91	38760.	10.401	-398.4	257.8	19.15	13.40	19.37	1678
35	25.07	37970.	10.282	-383.2	277.3	19.71	13.51	19.72	1669
36	25.25	37183.	10.158	-367.9	297.2	20.27	13.60	20.06	1660
37	25.42	36416.	10.029	-352.3	317.4	20.83	13.69	20.38	1651
38	25.60	35677.	9.896	-336.5	338.0	21.37	13.77	20.69	1642
39	25.79	34963.	9.761	-320.5	358.8	21.92	13.82	20.98	1633
40	25.97	34249.	9.625	-304.3	379.9	22.45	13.87	21.27	1624
41	26.17	33564.	9.484	-288.0	401.4	22.98	13.92	21.54	1616
42	26.36	32905.	9.341	-271.4	423.0	23.50	13.97	21.81	1607
43	26.56	32287.	9.197	-254.8	445.0	24.02	14.01	22.06	1599
44	26.76	31685.	9.052	-237.9	467.1	24.53	14.05	22.31	1590
45	26.97	31085.	8.908	-220.9	489.6	25.03	14.10	22.56	1581
46	27.18	30514.	8.763	-203.7	512.3	25.53	14.15	22.82	1572
47	27.39	29963.	8.619	-186.4	535.2	26.03	14.20	23.06	1564
48	27.61	29428.	8.474	-169.0	558.4	26.51	14.26	23.30	1555
49	27.83	28904.	8.331	-151.4	581.8	27.00	14.31	23.54	1546
50	28.06	28403.	8.189	-133.7	605.5	27.48	14.36	23.78	1537
51	28.29	27918.	8.048	-115.8	629.4	27.95	14.41	24.01	1529
52	28.52	27454.	7.908	-97.8	653.5	28.42	14.46	24.23	1520
53	28.75	27011.	7.770	-79.7	677.8	28.88	14.52	24.44	1512
54	28.99	26586.	7.634	-61.5	702.4	29.34	14.57	24.65	1504
55	29.24	26179.	7.498	-43.1	727.1	29.79	14.62	24.85	1495
56	29.48	25778.	7.363	-24.1	752.6	30.25	14.67	25.05	1487
57	29.73	25394.	7.232	-5.6	777.8	30.70	14.71	25.23	1479
58	29.99	25028.	7.103	13.1	803.1	31.14	14.76	25.41	1472
59	30.24	24678.	6.974	31.8	828.6	31.57	14.81	25.59	1464
60	30.50	24345.	6.847	50.6	854.2	32.01	14.86	25.76	1456
61	30.77	24015.	6.722	69.5	880.1	32.43	14.92	25.93	1448
62	31.03	23701.	6.600	88.5	906.1	32.86	14.98	26.10	1441
63	31.30	23404.	6.480	107.6	932.3	33.27	15.04	26.27	1433
64	31.58	23122.	6.363	126.7	958.6	33.69	15.11	26.43	1426
65	31.85	22855.	6.248	146.0	985.1	34.10	15.18	26.60	1419
66	32.13	22594.	6.136	165.3	1011.8	34.51	15.26	26.76	1411
67	32.41	22347.	6.026	184.7	1038.7	34.91	15.34	26.93	1404
68	32.70	22112.	5.918	204.3	1065.7	35.31	15.43	27.09	1397
69	32.99	21891.	5.814	223.9	1092.8	35.71	15.52	27.26	1390
70	33.28	21682.	5.713	243.5	1120.2	36.10	15.61	27.43	1384
71	33.57	21483.	5.612	263.3	1147.7	36.49	15.71	27.60	1377
72	33.86	21296.	5.512	283.2	1175.3	36.88	15.81	27.75	1371
73	34.16	21122.	5.417	303.2	1203.2	37.26	15.92	27.91	1364
74	34.46	20959.	5.323	323.3	1231.2	37.64	16.04	28.07	1358
75	34.76	20809.	5.231	343.4	1259.3	38.02	16.15	28.23	1352
76	35.07	20658.	5.140	363.7	1287.6	38.40	16.27	28.39	1346
77	35.38	20518.	5.053	384.1	1316.1	38.77	16.40	28.55	1340
78	35.69	20387.	4.966	404.6	1344.7	39.14	16.53	28.70	1334
79	36.00	20267.	4.883	425.2	1373.5	39.50	16.66	28.86	1328
80	36.31	20156.	4.802	445.8	1402.4	39.87	16.80	29.02	1323
81	36.62	20047.	4.722	466.6	1431.5	40.23	16.93	29.18	1318
82	36.94	19946.	4.644	487.6	1460.7	40.59	17.08	29.34	1312
83	37.26	19851.	4.568	508.6	1490.2	40.94	17.22	29.50	1307
84	37.58	19764.	4.494	529.7	1519.7	41.30	17.37	29.65	1302
85	37.90	19684.	4.422	551.0	1549.4	41.65	17.52	29.81	1297
86	38.22	19611.	4.352	572.3	1579.3	42.00	17.67	29.97	1293
87	38.55	19546.	4.284	593.8	1609.4	42.35	17.83	30.13	1288
88	38.88	19486.	4.217	615.4	1639.6	42.69	17.99	30.28	1284
89	39.20	19433.	4.151	637.1	1669.9	43.04	18.14	30.44	1280
90	39.53	19387.	4.088	659.0	1700.4	43.38	18.31	30.59	1276
91	39.86	19350.	4.026	680.9	1731.1	43.71	18.47	30.74	1272
92	40.19	19319.	3.966	703.0	1761.9	44.05	18.63	30.89	1269
93	40.52	19293.	3.907	725.2	1792.8	44.39	18.79	31.04	1265
94	40.86	19272.	3.849	747.6	1823.9	44.72	18.96	31.18	1262
95	41.19	19255.	3.793	770.0	1855.2	45.05	19.13	31.33	1259
96	41.53	19232.	3.738	792.6	1886.6	45.38	19.29	31.48	1256
97	41.86	19213.	3.685	815.3	1918.1	45.71	19.46	31.63	1253
98	42.20	19200.	3.633	838.2	1949.8	46.03	19.62	31.78	1250
99	42.53	19191.	3.581	861.1	1981.7	46.35	19.79	31.92	1247
100	42.87	19185.	3.532	884.2	2013.7	46.68	19.96	32.07	1245

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

280.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 21.287	22.89	52362.	11.376	-564.6	84.7	11.10	11.23	14.02	1813
22	22.97	51956.	11.408	-556.8	94.8	11.56	11.39	14.34	1813
23	23.08	50617.	11.383	-545.6	109.4	12.21	11.61	14.79	1800
24	23.21	49718.	11.351	-534.0	124.4	12.85	11.83	15.23	1793
25	23.33	48831.	11.322	-522.1	139.8	13.48	12.04	15.66	1787
26	23.46	47978.	11.274	-509.8	155.7	14.10	12.24	16.08	1780
27	23.59	47046.	11.213	-497.3	172.0	14.72	12.42	16.49	1772
28	23.72	46165.	11.146	-484.4	188.7	15.33	12.59	16.89	1764
29	23.86	45273.	11.074	-471.2	205.8	15.92	12.76	17.29	1756
30	24.00	44360.	10.993	-457.7	223.2	16.52	12.90	17.67	1748
31	24.15	43585.	10.905	-444.0	241.1	17.10	13.04	18.04	1741
32	24.29	42765.	10.809	-429.9	259.3	17.68	13.17	18.40	1733
33	24.44	41922.	10.706	-415.6	277.9	18.25	13.30	18.76	1724
34	24.60	41064.	10.601	-401.1	296.8	18.82	13.41	19.12	1715
35	24.76	40268.	10.493	-386.3	316.1	19.38	13.52	19.46	1707
36	24.92	39491.	10.375	-371.2	335.7	19.93	13.62	19.79	1698
37	25.08	38711.	10.251	-355.9	355.7	20.48	13.71	20.11	1689
38	25.25	37971.	10.123	-340.4	376.0	21.02	13.79	20.42	1681
39	25.42	37242.	9.991	-324.8	396.5	21.55	13.85	20.70	1672
40	25.60	36561.	9.856	-308.9	417.4	22.08	13.91	20.97	1664
41	25.78	35852.	9.721	-292.8	438.5	22.60	13.96	21.24	1656
42	25.96	35178.	9.586	-276.6	459.8	23.12	14.01	21.50	1647
43	26.14	34541.	9.447	-260.3	481.5	23.62	14.06	21.75	1639
44	26.33	33933.	9.306	-243.7	503.3	24.13	14.10	22.00	1631
45	26.52	33314.	9.165	-227.1	525.5	24.62	14.15	22.24	1622
46	26.72	32727.	9.024	-210.2	547.9	25.12	14.21	22.49	1614
47	26.92	32178.	8.885	-193.2	570.5	25.61	14.26	22.73	1605
48	27.12	31640.	8.746	-176.1	593.3	26.09	14.32	22.96	1597
49	27.33	31102.	8.606	-158.9	616.4	26.56	14.37	23.20	1589
50	27.53	30587.	8.467	-141.4	639.7	27.03	14.42	23.43	1580
51	27.75	30087.	8.329	-123.9	663.3	27.50	14.48	23.65	1572
52	27.96	29613.	8.193	-106.2	687.0	27.96	14.53	23.87	1564
53	28.18	29159.	8.059	-88.4	711.0	28.42	14.58	24.08	1556
54	28.40	28725.	7.924	-70.5	735.2	28.87	14.64	24.28	1548
55	28.62	28309.	7.791	-52.5	759.6	29.32	14.69	24.48	1540
56	28.85	27897.	7.661	-33.8	784.7	29.77	14.74	24.68	1532
57	29.08	27502.	7.532	-15.6	809.5	30.21	14.79	24.86	1524
58	29.31	27124.	7.403	2.8	834.4	30.64	14.84	25.04	1517
59	29.55	26764.	7.277	21.2	859.5	31.07	14.89	25.21	1509
60	29.79	26418.	7.154	39.7	884.8	31.50	14.94	25.39	1502
61	30.03	26076.	7.031	58.3	910.3	31.92	15.00	25.57	1495
62	30.27	25748.	6.909	77.1	936.0	32.34	15.06	25.73	1487
63	30.52	25436.	6.790	95.8	961.8	32.75	15.12	25.90	1480
64	30.77	25138.	6.672	114.7	987.7	33.16	15.19	26.07	1472
65	31.02	24854.	6.557	133.7	1013.9	33.56	15.26	26.23	1465
66	31.28	24580.	6.443	152.8	1040.2	33.96	15.34	26.39	1458
67	31.54	24317.	6.333	171.9	1066.7	34.36	15.42	26.56	1451
68	31.80	24066.	6.225	191.2	1093.3	34.76	15.51	26.73	1444
69	32.06	23826.	6.120	210.6	1120.1	35.15	15.60	26.89	1437
70	32.32	23599.	6.017	230.0	1147.1	35.54	15.69	27.06	1430
71	32.59	23376.	5.915	249.6	1174.2	35.92	15.79	27.23	1423
72	32.86	23168.	5.816	269.2	1201.6	36.30	15.89	27.40	1417
73	33.13	22973.	5.722	289.0	1229.0	36.68	16.00	27.58	1411
74	33.41	22791.	5.629	308.9	1256.7	37.06	16.12	27.75	1404
75	33.69	22621.	5.534	328.8	1284.5	37.43	16.23	27.91	1398
76	33.96	22454.	5.442	348.9	1312.5	37.80	16.35	28.07	1392
77	34.24	22296.	5.354	369.1	1340.7	38.17	16.48	28.24	1386
78	34.53	22148.	5.268	389.4	1369.0	38.54	16.61	28.41	1380
79	34.81	22008.	5.182	409.8	1397.5	38.90	16.74	28.58	1374
80	35.10	21880.	5.097	430.4	1426.1	39.26	16.88	28.73	1368
81	35.38	21760.	5.016	451.0	1454.9	39.62	17.02	28.90	1363
82	35.67	21646.	4.936	471.8	1483.9	39.97	17.16	29.06	1357
83	35.96	21536.	4.859	492.7	1513.0	40.33	17.30	29.23	1352
84	36.26	21432.	4.783	513.7	1542.3	40.68	17.45	29.39	1347
85	36.55	21335.	4.708	534.8	1571.8	41.03	17.60	29.56	1342
86	36.85	21245.	4.635	556.1	1601.4	41.37	17.76	29.72	1337
87	37.14	21162.	4.564	577.4	1631.2	41.72	17.91	29.88	1332
88	37.44	21084.	4.495	598.9	1661.1	42.06	18.07	30.05	1328
89	37.74	21014.	4.428	620.6	1691.3	42.40	18.23	30.21	1323
90	38.04	20949.	4.362	642.3	1721.6	42.74	18.39	30.37	1319
91	38.34	20893.	4.298	664.2	1752.0	43.07	18.55	30.53	1315
92	38.64	20844.	4.235	686.2	1782.6	43.41	18.71	30.69	1311
93	38.95	20803.	4.174	708.4	1813.4	43.74	18.88	30.85	1307
94	39.25	20768.	4.114	730.6	1844.3	44.07	19.04	31.00	1304
95	39.56	20738.	4.056	753.0	1875.4	44.40	19.21	31.15	1300
96	39.87	20701.	3.998	775.6	1906.6	44.73	19.37	31.31	1297
97	40.17	20669.	3.943	798.3	1938.0	45.05	19.54	31.47	1293
98	40.48	20641.	3.888	821.1	1969.5	45.38	19.70	31.62	1290
99	40.79	20619.	3.835	844.0	2001.2	45.70	19.87	31.77	1287
100	41.10	20601.	3.783	867.0	2033.1	46.02	20.04	31.92	1284

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

300.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^6 ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 21.732	22.74	54403.	11.412	-558.9	132.3	11.16	11.30	14.03	1842
22	22.77	54286.	11.430	-556.0	136.1	11.34	11.37	14.15	1843
23	22.88	52702.	11.475	-545.0	150.5	11.98	11.59	14.64	1829
24	23.00	51818.	11.483	-533.7	165.4	12.61	11.81	15.08	1824
25	23.11	50968.	11.453	-522.0	180.7	13.23	12.02	15.50	1818
26	23.24	50194.	11.421	-510.0	196.3	13.85	12.22	15.92	1813
27	23.36	49266.	11.363	-497.6	212.5	14.46	12.41	16.32	1805
28	23.49	48372.	11.294	-485.0	229.0	15.06	12.58	16.71	1797
29	23.62	47497.	11.226	-472.0	245.9	15.65	12.75	17.10	1789
30	23.75	46562.	11.155	-458.8	263.2	16.24	12.89	17.47	1781
31	23.89	45783.	11.079	-445.3	280.8	16.82	13.04	17.84	1775
32	24.03	44968.	10.990	-431.5	298.9	17.39	13.17	18.20	1767
33	24.17	44133.	10.893	-417.5	317.2	17.95	13.30	18.55	1759
34	24.32	43329.	10.789	-403.2	336.0	18.51	13.42	18.89	1751
35	24.46	42517.	10.682	-388.6	355.0	19.06	13.52	19.22	1743
36	24.62	41766.	10.579	-373.9	374.4	19.61	13.63	19.55	1735
37	24.77	40969.	10.468	-358.9	394.1	20.15	13.73	19.88	1727
38	24.93	40226.	10.344	-343.7	414.1	20.68	13.81	20.18	1719
39	25.09	39474.	10.215	-328.3	434.4	21.21	13.88	20.46	1710
40	25.25	38856.	10.083	-312.7	455.0	21.73	13.94	20.70	1703
41	25.42	38127.	9.948	-296.9	475.8	22.25	14.00	20.97	1694
42	25.59	37424.	9.811	-281.0	496.9	22.76	14.05	21.22	1685
43	25.77	36760.	9.676	-264.9	518.3	23.26	14.10	21.47	1677
44	25.94	36139.	9.543	-248.7	539.9	23.75	14.15	21.71	1669
45	26.12	35490.	9.405	-232.3	561.7	24.25	14.20	21.95	1661
46	26.30	34881.	9.267	-215.7	583.9	24.73	14.26	22.20	1652
47	26.49	34336.	9.129	-199.0	606.2	25.21	14.32	22.43	1644
48	26.68	33801.	8.993	-182.2	628.7	25.69	14.37	22.66	1636
49	26.87	33248.	8.858	-165.2	651.5	26.16	14.43	22.89	1628
50	27.06	32719.	8.724	-148.1	674.5	26.62	14.49	23.12	1620
51	27.26	32201.	8.590	-130.9	697.7	27.08	14.54	23.34	1612
52	27.46	31713.	8.456	-113.5	721.2	27.54	14.60	23.55	1604
53	27.66	31248.	8.323	-96.0	744.8	27.99	14.65	23.76	1596
54	27.87	30806.	8.192	-78.4	768.7	28.43	14.71	23.96	1588
55	28.07	30383.	8.064	-60.6	792.8	28.88	14.76	24.16	1581
56	28.29	29959.	7.936	-42.2	817.6	29.32	14.81	24.36	1573
57	28.50	29555.	7.808	-24.3	842.0	29.76	14.86	24.53	1566
58	28.71	29171.	7.683	-6.2	866.6	30.19	14.91	24.71	1559
59	28.93	28801.	7.561	12.0	891.4	30.61	14.96	24.89	1552
60	29.15	28446.	7.437	30.2	916.5	31.03	15.01	25.06	1545
61	29.38	28098.	7.315	48.6	941.6	31.44	15.07	25.23	1538
62	29.60	27762.	7.197	67.0	966.9	31.86	15.13	25.40	1530
63	29.83	27438.	7.082	85.6	992.4	32.26	15.20	25.58	1524
64	30.06	27125.	6.964	104.2	1018.1	32.67	15.27	25.75	1516
65	30.30	26828.	6.849	123.0	1043.9	33.07	15.34	25.91	1509
66	30.53	26546.	6.736	141.8	1069.9	33.47	15.42	26.08	1502
67	30.77	26273.	6.625	160.7	1096.0	33.86	15.50	26.24	1495
68	31.01	26009.	6.515	179.8	1122.4	34.25	15.59	26.40	1488
69	31.25	25756.	6.408	198.9	1148.8	34.64	15.68	26.56	1481
70	31.49	25513.	6.304	218.1	1175.5	35.02	15.77	26.73	1474
71	31.74	25267.	6.202	237.5	1202.3	35.40	15.87	26.91	1467
72	31.99	25036.	6.103	256.9	1229.3	35.78	15.98	27.08	1461
73	32.24	24821.	6.006	276.5	1256.5	36.15	16.08	27.26	1454
74	32.49	24619.	5.910	296.1	1283.8	36.52	16.20	27.43	1448
75	32.75	24432.	5.815	315.9	1311.3	36.89	16.31	27.59	1441
76	33.00	24250.	5.727	335.8	1339.0	37.26	16.43	27.78	1435
77	33.26	24078.	5.641	355.8	1366.9	37.62	16.56	27.96	1430
78	33.52	23911.	5.552	376.0	1395.0	37.99	16.69	28.14	1423
79	33.78	23755.	5.464	396.3	1423.2	38.35	16.82	28.30	1417
80	34.05	23612.	5.379	416.6	1451.5	38.70	16.96	28.47	1412
81	34.31	23490.	5.298	437.1	1480.1	39.06	17.10	28.64	1406
82	34.58	23366.	5.218	457.8	1508.8	39.41	17.24	28.81	1401
83	34.85	23247.	5.137	478.5	1537.7	39.76	17.38	28.98	1396
84	35.11	23131.	5.058	499.4	1566.7	40.11	17.53	29.14	1390
85	35.38	23019.	4.982	520.4	1596.0	40.45	17.68	29.31	1385
86	35.66	22916.	4.907	541.5	1625.4	40.80	17.84	29.48	1380
87	35.93	22816.	4.835	562.8	1654.9	41.14	17.99	29.65	1375
88	36.20	22723.	4.764	584.2	1684.6	41.48	18.15	29.82	1370
89	36.48	22634.	4.695	605.7	1714.6	41.82	18.31	29.99	1365
90	36.75	22552.	4.626	627.4	1744.6	42.15	18.47	30.16	1361
91	37.03	22469.	4.559	649.2	1774.9	42.49	18.63	30.32	1356
92	37.31	22390.	4.495	671.1	1805.3	42.82	18.79	30.50	1352
93	37.59	22338.	4.431	693.2	1835.9	43.15	18.96	30.66	1348
94	37.87	22285.	4.369	715.4	1866.6	43.48	19.12	30.82	1344
95	38.15	22240.	4.309	737.8	1897.5	43.81	19.29	30.98	1340
96	38.43	22190.	4.250	760.2	1928.6	44.13	19.45	31.15	1336
97	38.72	22144.	4.192	782.9	1959.8	44.45	19.62	31.31	1333
98	39.00	22104.	4.135	805.6	1991.2	44.78	19.78	31.47	1329
99	39.29	22068.	4.080	828.5	2022.7	45.10	19.95	31.63	1326
100	39.57	22038.	4.026	851.5	2054.4	45.42	20.11	31.78	1323

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

320.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME CM^3/GMOLE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 22.169	22.60	56275.	11.441	-553.1	179.7	11.23	11.37	14.04	1869
23	22.69	54699.	11.522	-544.1	191.6	11.75	11.56	14.47	1855
24	22.80	53818.	11.569	-533.0	206.2	12.38	11.78	14.93	1851
25	22.91	53031.	11.574	-521.5	221.3	12.99	12.00	15.35	1847
26	23.03	52357.	11.546	-509.7	236.9	13.60	12.20	15.76	1844
27	23.14	51446.	11.506	-497.6	252.9	14.21	12.40	16.17	1836
28	23.27	50527.	11.429	-485.1	269.2	14.80	12.58	16.55	1828
29	23.39	49669.	11.350	-472.4	286.0	15.39	12.74	16.91	1820
30	23.52	48717.	11.291	-459.4	303.1	15.97	12.89	17.29	1812
31	23.65	47867.	11.222	-446.2	320.5	16.54	13.03	17.65	1805
32	23.78	47039.	11.159	-432.6	338.4	17.11	13.17	18.02	1799
33	23.91	46260.	11.077	-418.8	356.6	17.67	13.29	18.37	1792
34	24.05	45557.	10.979	-404.8	375.1	18.22	13.42	18.69	1786
35	24.19	44726.	10.874	-390.5	393.9	18.77	13.53	19.02	1778
36	24.34	44014.	10.763	-376.0	413.1	19.31	13.64	19.32	1770
37	24.48	43204.	10.655	-361.2	432.6	19.84	13.73	19.64	1762
38	24.63	42459.	10.554	-346.3	452.4	20.37	13.82	19.95	1755
39	24.79	41664.	10.439	-331.1	472.5	20.89	13.90	20.25	1747
40	24.94	41158.	10.308	-315.8	492.8	21.41	13.96	20.47	1741
41	25.10	40392.	10.174	-300.3	513.4	21.92	14.03	20.73	1732
42	25.26	39664.	10.038	-284.6	534.3	22.42	14.08	20.98	1723
43	25.42	38946.	9.900	-268.8	555.4	22.91	14.14	21.23	1714
44	25.59	38291.	9.761	-252.8	576.8	23.41	14.20	21.46	1706
45	25.75	37618.	9.627	-236.7	598.3	23.89	14.25	21.70	1697
46	25.92	36983.	9.495	-220.4	620.2	24.37	14.31	21.95	1688
47	26.10	36444.	9.361	-204.0	642.2	24.85	14.37	22.17	1681
48	26.27	35914.	9.225	-187.4	664.5	25.32	14.43	22.39	1673
49	26.45	35347.	9.091	-170.7	687.0	25.78	14.49	22.62	1665
50	26.63	34800.	8.958	-153.8	709.8	26.24	14.55	22.84	1657
51	26.82	34261.	8.828	-136.9	732.7	26.69	14.60	23.06	1649
52	27.01	33754.	8.700	-119.7	755.9	27.14	14.66	23.28	1641
53	27.20	33276.	8.570	-102.5	779.3	27.59	14.72	23.48	1634
54	27.39	32823.	8.442	-85.1	802.9	28.03	14.77	23.68	1626
55	27.58	32393.	8.314	-67.6	826.6	28.47	14.83	23.88	1619
56	27.78	31961.	8.187	-49.5	851.1	28.91	14.88	24.06	1612
57	27.98	31557.	8.065	-31.8	875.3	29.34	14.93	24.25	1605
58	28.18	31157.	7.944	-14.0	899.7	29.76	14.98	24.43	1598
59	28.38	30781.	7.820	3.9	924.2	30.18	15.03	24.60	1591
60	28.59	30423.	7.699	21.9	948.8	30.59	15.09	24.76	1584
61	28.80	30076.	7.582	40.0	973.7	31.00	15.14	24.94	1578
62	29.01	29733.	7.466	58.3	998.8	31.41	15.21	25.12	1571
63	29.22	29403.	7.348	76.6	1024.0	31.82	15.27	25.28	1564
64	29.43	29085.	7.232	95.0	1049.3	32.22	15.34	25.45	1557
65	29.65	28778.	7.122	113.5	1074.9	32.61	15.42	25.62	1550
66	29.87	28489.	7.013	132.2	1100.6	33.00	15.50	25.80	1544
67	30.09	28210.	6.902	150.9	1126.5	33.39	15.58	25.96	1537
68	30.31	27939.	6.792	169.7	1152.5	33.78	15.67	26.12	1530
69	30.54	27675.	6.685	188.6	1178.7	34.16	15.76	26.29	1523
70	30.76	27421.	6.579	207.7	1205.1	34.54	15.85	26.45	1516
71	30.99	27168.	6.476	226.8	1231.7	34.92	15.95	26.63	1509
72	31.22	26894.	6.373	246.1	1258.4	35.29	16.06	26.80	1502
73	31.45	26659.	6.276	265.4	1285.2	35.66	16.17	26.97	1495
74	31.69	26438.	6.179	284.9	1312.3	36.03	16.28	27.15	1489
75	31.92	26237.	6.086	304.5	1339.5	36.40	16.39	27.33	1482
76	32.16	26040.	5.994	324.2	1366.9	36.76	16.51	27.50	1476
77	32.40	25855.	5.903	344.1	1394.5	37.12	16.64	27.67	1470
78	32.64	25679.	5.813	364.0	1422.3	37.48	16.77	27.85	1464
79	32.88	25511.	5.728	384.1	1450.2	37.83	16.90	28.02	1458
80	33.12	25357.	5.647	404.3	1478.3	38.19	17.03	28.22	1453
81	33.37	25229.	5.567	424.7	1506.8	38.54	17.17	28.40	1448
82	33.62	25109.	5.483	445.2	1535.2	38.89	17.31	28.56	1443
83	33.86	24988.	5.400	465.9	1563.9	39.24	17.46	28.71	1437
84	34.11	24865.	5.323	486.6	1592.7	39.58	17.61	28.89	1432
85	34.36	24745.	5.248	507.5	1621.6	39.92	17.76	29.08	1427
86	34.62	24622.	5.172	528.5	1650.9	40.27	17.91	29.26	1422
87	34.87	24510.	5.096	549.7	1680.3	40.61	18.07	29.43	1416
88	35.12	24402.	5.022	571.0	1709.8	40.94	18.23	29.59	1411
89	35.38	24300.	4.951	592.4	1739.5	41.28	18.38	29.77	1406
90	35.63	24203.	4.881	614.0	1769.3	41.61	18.54	29.94	1401
91	35.89	24083.	4.813	635.7	1799.4	41.94	18.71	30.13	1396
92	36.15	23981.	4.747	657.6	1829.6	42.28	18.87	30.31	1391
93	36.41	23893.	4.681	679.6	1860.0	42.60	19.03	30.49	1387
94	36.67	23818.	4.617	701.7	1890.6	42.93	19.20	30.66	1383
95	36.93	23753.	4.553	724.0	1921.3	43.26	19.36	30.82	1378
96	37.19	23692.	4.492	746.4	1952.2	43.58	19.53	30.99	1375
97	37.45	23634.	4.433	768.9	1983.2	43.90	19.69	31.15	1371
98	37.71	23582.	4.374	791.6	2014.5	44.22	19.86	31.32	1367
99	37.98	23534.	4.317	814.5	2045.9	44.54	20.02	31.48	1364
100	38.24	23492.	4.261	837.4	2077.4	44.86	20.19	31.64	1360

* TWO-PHASE BOUNDARY

TABLE X. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOBARS-CONTINUED

340.0 ATMOSPHERE ISOBAR

TEMPERATURE DEG. KELVIN	VOLUME $CM^3/GMOLE$	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3 ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
* 22.600	22.47	57415.	11.496	-547.3	227.0	11.30	11.42	14.09	1886
23	22.51	56651.	11.543	-542.9	232.4	11.54	11.51	14.29	1880
24	22.61	55708.	11.638	-532.0	247.0	12.16	11.74	14.77	1876
25	22.72	55008.	11.687	-520.8	261.9	12.77	11.96	15.21	1875
26	22.83	54482.	11.688	-509.1	277.3	13.37	12.17	15.62	1874
27	22.94	53586.	11.652	-497.2	293.1	13.97	12.38	16.03	1867
28	23.06	52625.	11.594	-485.0	309.4	14.56	12.58	16.43	1859
29	23.18	51783.	11.497	-472.4	326.0	15.14	12.76	16.79	1851
30	23.30	50823.	11.362	-459.7	342.9	15.72	12.90	17.09	1840
31	23.42	49807.	11.296	-446.6	360.2	16.28	13.03	17.45	1831
32	23.55	48972.	11.275	-433.3	377.9	16.84	13.17	17.83	1826
33	23.67	48329.	11.211	-419.8	395.8	17.40	13.29	18.16	1822
34	23.80	47787.	11.166	-406.0	414.1	17.94	13.41	18.50	1820
35	23.94	46897.	11.069	-391.9	432.9	18.49	13.53	18.84	1812
36	24.08	46247.	10.962	-377.6	451.9	19.02	13.64	19.13	1806
37	24.22	45415.	10.850	-363.1	471.2	19.55	13.74	19.44	1797
38	24.36	44660.	10.729	-348.4	490.8	20.07	13.83	19.72	1789
39	24.50	43833.	10.624	-333.5	510.6	20.59	13.91	20.02	1781
40	24.64	43511.	10.528	-318.4	530.6	21.10	13.98	20.25	1780
41	24.80	42677.	10.406	-303.1	551.2	21.60	14.05	20.53	1771
42	24.95	41913.	10.268	-287.6	571.9	22.10	14.11	20.77	1761
43	25.10	41109.	10.130	-272.0	592.7	22.59	14.18	21.03	1751
44	25.26	40392.	9.988	-256.3	613.9	23.08	14.24	21.26	1741
45	25.42	39688.	9.849	-240.4	635.2	23.56	14.29	21.49	1732
46	25.58	39018.	9.708	-224.3	656.8	24.04	14.36	21.73	1722
47	25.74	38504.	9.575	-208.2	678.6	24.50	14.43	21.94	1716
48	25.90	37981.	9.446	-191.8	700.6	24.97	14.49	22.16	1709
49	26.07	37386.	9.313	-175.3	722.9	25.43	14.55	22.38	1700
50	26.24	36826.	9.180	-158.7	745.4	25.88	14.61	22.60	1692
51	26.42	36261.	9.048	-142.0	768.1	26.33	14.67	22.81	1683
52	26.59	35732.	8.919	-125.1	791.0	26.78	14.73	23.02	1676
53	26.77	35242.	8.794	-108.1	814.1	27.22	14.78	23.23	1668
54	26.95	34777.	8.671	-91.0	837.5	27.65	14.84	23.43	1661
55	27.13	34337.	8.547	-73.7	861.0	28.08	14.90	23.63	1654
56	27.32	33895.	8.424	-55.8	885.3	28.52	14.95	23.81	1647
57	27.50	33479.	8.301	-38.3	909.1	28.94	15.00	23.99	1641
58	27.69	33080.	8.179	-20.8	933.2	29.36	15.05	24.16	1634
59	27.88	32702.	8.061	-3.1	957.5	29.78	15.10	24.33	1627
60	28.07	32339.	7.945	14.7	981.9	30.19	15.16	24.51	1621
61	28.27	31996.	7.829	32.6	1006.5	30.60	15.22	24.68	1615
62	28.47	31661.	7.711	50.6	1031.3	31.00	15.28	24.84	1608
63	28.67	31332.	7.598	68.7	1056.2	31.40	15.35	25.01	1602
64	28.87	31011.	7.488	86.9	1081.3	31.79	15.42	25.19	1596
65	29.07	30692.	7.377	105.2	1106.7	32.19	15.49	25.36	1589
66	29.27	30413.	7.265	123.6	1132.1	32.57	15.57	25.51	1583
67	29.48	30134.	7.155	142.2	1157.7	32.96	15.65	25.68	1576
68	29.69	29861.	7.052	160.8	1183.5	33.34	15.74	25.85	1570
69	29.90	29582.	6.948	179.6	1209.6	33.72	15.83	26.03	1563
70	30.11	29320.	6.842	198.4	1235.7	34.10	15.93	26.20	1557
71	30.32	29019.	6.738	217.4	1262.0	34.47	16.03	26.38	1549
72	30.54	28740.	6.636	236.5	1288.4	34.84	16.14	26.56	1542
73	30.75	28480.	6.536	255.7	1315.1	35.21	16.24	26.74	1535
74	30.97	28241.	6.437	275.0	1341.9	35.57	16.36	26.91	1528
75	31.19	28015.	6.340	294.4	1368.9	35.93	16.47	27.08	1521
76	31.41	27820.	6.247	313.9	1396.0	36.29	16.59	27.25	1515
77	31.63	27627.	6.156	333.6	1423.3	36.65	16.72	27.43	1509
78	31.85	27441.	6.067	353.4	1450.8	37.01	16.85	27.60	1503
79	32.08	27263.	5.980	373.4	1478.5	37.36	16.98	27.78	1497
80	32.31	27089.	5.894	393.5	1506.4	37.71	17.11	27.96	1492
81	32.53	26992.	5.810	413.7	1534.4	38.06	17.25	28.11	1487
82	32.76	26887.	5.727	434.0	1562.6	38.40	17.39	28.27	1482
83	32.99	26765.	5.650	454.5	1591.1	38.75	17.54	28.45	1477
84	33.22	26647.	5.578	475.1	1619.6	39.09	17.68	28.65	1473
85	33.46	26503.	5.499	495.9	1648.8	39.44	17.83	28.84	1468
86	33.70	26380.	5.420	516.8	1677.7	39.77	17.99	29.00	1462
87	33.93	26255.	5.342	537.9	1706.8	40.11	18.14	29.17	1457
88	34.17	26137.	5.272	559.1	1736.1	40.44	18.30	29.37	1452
89	34.40	26023.	5.202	580.4	1765.5	40.78	18.46	29.56	1447
90	34.64	25898.	5.130	602.0	1795.5	41.11	18.62	29.74	1442
91	34.88	25733.	5.058	623.6	1825.3	41.44	18.78	29.94	1436
92	35.12	25592.	4.988	645.3	1855.3	41.77	18.94	30.13	1430
93	35.36	25470.	4.921	667.3	1885.6	42.10	19.11	30.31	1425
94	35.61	25365.	4.855	689.3	1916.0	42.42	19.27	30.50	1420
95	35.85	25277.	4.791	711.5	1946.5	42.75	19.44	30.67	1416
96	36.09	25201.	4.729	733.9	1977.3	43.07	19.60	30.85	1412
97	36.34	25131.	4.668	756.4	2008.2	43.39	19.77	31.02	1408
98	36.58	25066.	4.607	779.0	2039.3	43.71	19.94	31.19	1404
99	36.83	25007.	4.547	801.8	2070.6	44.02	20.10	31.35	1400
100	37.07	24957.	4.488	824.7	2101.9	44.34	20.27	31.51	1396

* TWO-PHASE BOUNDARY

TABLE X1. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3 ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.00002 GMOLE/CM^3 ISOCHORE									
14	0.023	1138.	0.002	173.9	289.7	85.28	12.48	20.90	309
15	0.025	1220.	0.002	186.4	310.5	86.14	12.48	20.89	320
16	0.026	1302.	0.002	198.8	331.3	86.95	12.48	20.88	331
17	0.028	1385.	0.002	211.3	352.2	87.70	12.48	20.88	341
18	0.029	1467.	0.002	223.8	373.0	88.42	12.48	20.87	351
19	0.031	1549.	0.002	236.3	393.8	89.09	12.48	20.87	361
20	0.033	1632.	0.002	248.8	414.6	89.73	12.48	20.86	370
21	0.034	1714.	0.002	261.2	435.4	90.34	12.48	20.86	379
22	0.036	1796.	0.002	273.7	456.2	90.92	12.48	20.85	388
23	0.038	1878.	0.002	286.2	477.0	91.47	12.48	20.85	397
24	0.039	1961.	0.002	298.7	497.8	92.01	12.48	20.85	406
25	0.041	2043.	0.002	311.2	518.6	92.51	12.48	20.84	414
26	0.043	2125.	0.002	323.6	539.4	93.00	12.48	20.84	422
27	0.044	2207.	0.002	336.1	560.2	93.48	12.48	20.84	430
28	0.046	2289.	0.002	348.6	581.0	93.93	12.48	20.84	438
29	0.048	2372.	0.002	361.1	601.8	94.37	12.48	20.84	446
30	0.049	2454.	0.002	373.5	622.6	94.79	12.48	20.83	454
31	0.051	2536.	0.002	386.0	643.4	95.20	12.48	20.83	461
32	0.052	2618.	0.002	398.5	664.2	95.60	12.48	20.83	469
33	0.054	2700.	0.002	411.0	685.0	95.98	12.48	20.83	476
34	0.056	2783.	0.002	423.5	705.8	96.35	12.48	20.83	483
35	0.057	2865.	0.002	435.9	726.6	96.71	12.48	20.83	490
36	0.059	2947.	0.002	448.4	747.4	97.06	12.48	20.83	497
37	0.061	3029.	0.002	460.9	768.2	97.41	12.48	20.83	504
38	0.062	3111.	0.002	473.4	789.0	97.74	12.49	20.83	511
39	0.064	3194.	0.002	485.9	809.8	98.06	12.49	20.83	517
40	0.066	3276.	0.002	498.4	830.6	98.38	12.50	20.84	524
42	0.069	3440.	0.002	523.4	872.3	98.99	12.51	20.85	537
44	0.072	3604.	0.002	548.4	914.0	99.57	12.53	20.87	549
46	0.075	3769.	0.002	573.5	955.7	100.13	12.55	20.89	561
48	0.079	3933.	0.002	598.6	997.5	100.67	12.59	20.93	573
50	0.082	4098.	0.002	623.9	1039.3	101.18	12.64	20.97	585
55	0.090	4508.	0.002	687.4	1144.5	102.39	12.81	21.14	612
60	0.098	4919.	0.002	752.1	1250.8	103.52	13.09	21.42	636
65	0.107	5330.	0.002	818.5	1358.8	104.58	13.47	21.80	658
70	0.115	5741.	0.002	887.1	1468.9	105.60	13.98	22.31	679
75	0.123	6151.	0.002	958.5	1581.9	106.58	14.60	22.92	697
80	0.131	6562.	0.002	1033.2	1698.3	107.55	15.31	23.64	714
85	0.139	6973.	0.002	1111.7	1818.4	108.50	16.10	24.43	729
90	0.148	7384.	0.002	1194.3	1942.6	109.44	16.94	25.27	744
95	0.156	7794.	0.002	1281.2	2071.1	110.38	17.82	26.14	758
100	0.164	8205.	0.002	1372.5	2203.9	111.32	18.69	27.02	772
0.00003 GMOLE/CM^3 ISOCHORE									
14	0.034	1132.	0.002	173.5	289.1	81.90	12.48	20.96	309
15	0.037	1215.	0.002	186.0	309.9	82.76	12.48	20.94	320
16	0.039	1297.	0.002	198.5	330.7	83.57	12.48	20.93	331
17	0.042	1380.	0.002	211.0	351.5	84.33	12.48	20.92	341
18	0.044	1462.	0.002	223.5	372.4	85.04	12.48	20.92	351
19	0.047	1544.	0.002	235.9	393.2	85.71	12.48	20.91	361
20	0.049	1627.	0.002	248.4	414.0	86.35	12.48	20.90	370
21	0.051	1709.	0.002	260.9	434.8	86.96	12.48	20.89	379
22	0.054	1791.	0.002	273.4	455.6	87.54	12.48	20.89	388
23	0.056	1874.	0.002	285.9	476.4	88.10	12.48	20.88	397
24	0.059	1956.	0.002	298.3	497.2	88.63	12.48	20.88	406
25	0.061	2038.	0.002	310.8	518.0	89.14	12.48	20.87	414
26	0.064	2121.	0.002	323.3	538.8	89.63	12.48	20.87	422
27	0.066	2203.	0.002	335.8	559.6	90.10	12.48	20.87	430
28	0.069	2285.	0.002	348.3	580.5	90.55	12.48	20.86	438
29	0.071	2368.	0.002	360.8	601.3	90.99	12.48	20.86	446
30	0.074	2450.	0.002	373.2	622.1	91.41	12.48	20.86	454
31	0.076	2532.	0.002	385.7	642.9	91.82	12.48	20.85	461
32	0.079	2614.	0.002	398.2	663.7	92.22	12.48	20.85	469
33	0.081	2697.	0.002	410.7	684.5	92.60	12.48	20.85	476
34	0.084	2779.	0.002	423.2	705.3	92.98	12.48	20.85	483
35	0.086	2861.	0.002	435.6	726.1	93.34	12.48	20.85	490
36	0.088	2943.	0.002	448.1	746.9	93.69	12.48	20.85	497
37	0.091	3026.	0.002	460.6	767.7	94.03	12.49	20.85	504
38	0.093	3108.	0.002	473.1	788.5	94.37	12.49	20.85	511
39	0.096	3190.	0.002	485.6	809.4	94.69	12.49	20.85	517
40	0.098	3272.	0.002	498.1	830.2	95.01	12.50	20.86	524
42	0.103	3437.	0.002	523.1	871.8	95.62	12.51	20.87	537
44	0.108	3601.	0.002	548.1	913.5	96.20	12.53	20.88	549
46	0.113	3766.	0.002	573.2	955.2	96.76	12.56	20.91	561
48	0.118	3930.	0.002	598.4	997.0	97.29	12.59	20.94	573
50	0.123	4095.	0.002	623.6	1038.9	97.81	12.64	20.98	585
55	0.135	4506.	0.002	687.2	1144.1	99.02	12.81	21.16	612
60	0.148	4917.	0.002	751.9	1250.4	100.14	13.09	21.43	636
65	0.160	5328.	0.002	818.2	1358.4	101.21	13.48	21.81	658
70	0.172	5739.	0.002	886.8	1468.6	102.22	13.98	22.32	679
75	0.185	6150.	0.002	958.2	1581.6	103.21	14.60	22.93	697
80	0.197	6561.	0.002	1033.0	1698.0	104.17	15.31	23.64	714
85	0.209	6972.	0.002	1111.5	1818.1	105.12	16.10	24.43	729
90	0.222	7383.	0.002	1194.1	1942.3	106.07	16.95	25.28	744
95	0.234	7794.	0.002	1281.0	2070.8	107.01	17.82	26.15	758
100	0.246	8205.	0.002	1372.3	2203.7	107.94	18.69	27.02	772

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3 ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.00004 GMOLE/CM^3 ISOCHORE									
14	0.046	1127.	0.003	173.1	288.4	79.50	12.49	21.02	309
15	0.049	1209.	0.003	185.6	309.3	80.36	12.49	21.00	320
16	0.052	1292.	0.003	198.1	330.1	81.17	12.49	20.99	330
17	0.055	1374.	0.003	210.6	350.9	81.93	12.49	20.97	341
18	0.059	1457.	0.003	223.1	371.7	82.64	12.49	20.96	351
19	0.062	1539.	0.003	235.6	392.6	83.32	12.49	20.95	360
20	0.065	1622.	0.003	248.1	413.4	83.96	12.49	20.94	370
21	0.069	1704.	0.003	260.6	434.2	84.57	12.49	20.93	379
22	0.072	1787.	0.003	273.0	455.0	85.15	12.49	20.92	388
23	0.075	1869.	0.003	285.5	475.8	85.70	12.49	20.92	397
24	0.078	1952.	0.003	298.0	496.7	86.23	12.49	20.91	405
25	0.082	2034.	0.003	310.5	517.5	86.74	12.48	20.90	414
26	0.085	2116.	0.003	323.0	538.3	87.23	12.48	20.90	422
27	0.088	2199.	0.003	335.5	559.1	87.70	12.48	20.89	430
28	0.092	2281.	0.003	348.0	579.9	88.16	12.48	20.89	438
29	0.095	2364.	0.003	360.4	600.7	88.60	12.48	20.89	446
30	0.098	2446.	0.003	372.9	621.6	89.02	12.48	20.88	453
31	0.101	2528.	0.003	385.4	642.4	89.43	12.48	20.88	461
32	0.105	2611.	0.003	397.9	663.2	89.82	12.48	20.87	468
33	0.108	2693.	0.003	410.4	684.0	90.21	12.48	20.87	476
34	0.111	2775.	0.003	422.9	704.8	90.58	12.48	20.87	483
35	0.115	2858.	0.003	435.3	725.6	90.94	12.49	20.87	490
36	0.118	2940.	0.003	447.8	746.4	91.30	12.49	20.87	497
37	0.121	3022.	0.003	460.3	767.3	91.64	12.49	20.87	504
38	0.124	3105.	0.003	472.8	788.1	91.97	12.49	20.87	511
39	0.128	3187.	0.003	485.3	808.9	92.30	12.49	20.87	517
40	0.131	3269.	0.003	497.8	829.7	92.61	12.50	20.87	524
42	0.138	3434.	0.003	522.8	871.4	93.22	12.51	20.88	537
44	0.144	3598.	0.003	547.8	913.1	93.80	12.53	20.90	549
46	0.151	3763.	0.003	572.9	954.8	94.36	12.56	20.92	561
48	0.157	3927.	0.003	598.1	996.6	94.90	12.59	20.95	573
50	0.164	4092.	0.003	623.3	1038.5	95.41	12.64	21.00	585
55	0.180	4503.	0.003	686.9	1143.7	96.62	12.81	21.17	611
60	0.197	4915.	0.003	751.6	1250.1	97.75	13.09	21.44	636
65	0.213	5326.	0.003	818.0	1358.0	98.81	13.48	21.82	658
70	0.230	5737.	0.003	886.6	1468.3	99.83	13.98	22.32	679
75	0.246	6148.	0.003	958.0	1581.3	100.81	14.60	22.94	697
80	0.262	6560.	0.003	1032.7	1697.7	101.78	15.31	23.65	714
85	0.279	6971.	0.003	1111.2	1817.8	102.73	16.10	24.44	729
90	0.295	7382.	0.003	1193.8	1942.0	103.67	16.95	25.28	744
95	0.312	7793.	0.003	1280.8	2070.5	104.61	17.82	26.15	758
100	0.328	8204.	0.003	1372.0	2203.4	105.55	18.69	27.03	772
0.00005 GMOLE/CM^3 ISOCHORE									
14	0.057	1121.	0.004	172.8	287.8	77.64	12.50	21.09	308
15	0.061	1204.	0.004	185.3	308.6	78.50	12.50	21.07	319
16	0.065	1287.	0.004	197.8	329.5	79.31	12.49	21.04	330
17	0.069	1369.	0.004	210.3	350.3	80.07	12.49	21.02	340
18	0.073	1452.	0.004	222.7	371.1	80.78	12.49	21.01	350
19	0.077	1535.	0.004	235.2	392.0	81.46	12.49	20.99	360
20	0.081	1617.	0.004	247.7	412.8	82.10	12.49	20.98	369
21	0.086	1700.	0.004	260.2	433.6	82.71	12.49	20.97	379
22	0.090	1782.	0.004	272.7	454.5	83.29	12.49	20.96	388
23	0.094	1865.	0.004	285.2	475.3	83.84	12.49	20.95	397
24	0.098	1947.	0.004	297.7	496.1	84.37	12.49	20.94	405
25	0.102	2030.	0.004	310.2	516.9	84.88	12.49	20.93	414
26	0.106	2112.	0.004	322.7	537.8	85.37	12.49	20.93	422
27	0.110	2195.	0.004	335.1	558.6	85.84	12.49	20.92	430
28	0.114	2277.	0.004	347.6	579.4	86.30	12.49	20.92	438
29	0.118	2360.	0.004	360.1	600.2	86.74	12.49	20.91	446
30	0.123	2442.	0.004	372.6	621.0	87.16	12.49	20.90	453
31	0.127	2524.	0.004	385.1	641.9	87.57	12.49	20.90	461
32	0.131	2607.	0.004	397.6	662.7	87.97	12.49	20.90	468
33	0.135	2689.	0.004	410.1	683.5	88.35	12.49	20.89	476
34	0.139	2772.	0.004	422.6	704.3	88.72	12.49	20.89	483
35	0.143	2854.	0.004	435.0	725.1	89.08	12.49	20.89	490
36	0.147	2936.	0.004	447.5	746.0	89.44	12.49	20.89	497
37	0.151	3019.	0.004	460.0	766.8	89.78	12.49	20.89	504
38	0.155	3101.	0.004	472.5	787.6	90.11	12.49	20.88	510
39	0.160	3184.	0.004	485.0	808.4	90.44	12.50	20.89	517
40	0.164	3266.	0.004	497.5	829.3	90.75	12.50	20.89	524
42	0.172	3431.	0.004	522.5	870.9	91.36	12.51	20.90	537
44	0.180	3595.	0.004	547.6	912.6	91.95	12.53	20.91	549
46	0.188	3760.	0.004	572.7	954.4	92.50	12.56	20.93	561
48	0.197	3925.	0.004	597.8	996.2	93.04	12.59	20.97	573
50	0.205	4089.	0.004	623.0	1038.1	93.55	12.64	21.01	584
55	0.225	4501.	0.004	686.6	1143.3	94.77	12.81	21.18	611
60	0.246	4912.	0.004	751.4	1249.7	95.89	13.09	21.45	636
65	0.266	5324.	0.004	817.7	1357.7	96.95	13.48	21.83	658
70	0.287	5735.	0.004	886.3	1467.9	97.97	13.98	22.33	679
75	0.308	6147.	0.004	957.7	1581.0	98.96	14.60	22.95	697
80	0.328	6558.	0.004	1032.5	1697.3	99.92	15.31	23.66	714
85	0.349	6970.	0.004	1111.0	1817.5	100.87	16.10	24.45	729
90	0.369	7381.	0.004	1193.6	1941.7	101.82	16.95	25.29	744
95	0.390	7791.	0.004	1280.5	2070.2	102.76	17.82	26.16	758
100	0.410	8204.	0.004	1371.8	2203.2	103.69	18.69	27.03	772

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.000075 GMOLE/CM^3 ISOCHORE									
• 14.170	0.086	1121.	0.006	173.9	289.6	74.40	12.53	21.28	309
15	0.091	1190.	0.006	184.3	307.0	75.11	12.52	21.24	318
16	0.097	1273.	0.006	196.8	327.9	75.92	12.51	21.19	329
17	0.103	1356.	0.006	209.3	348.7	76.68	12.51	21.16	340
18	0.109	1439.	0.006	221.9	369.6	77.40	12.51	21.13	350
19	0.116	1522.	0.006	234.4	390.5	78.07	12.50	21.10	359
20	0.122	1605.	0.006	246.9	411.3	78.71	12.50	21.08	369
21	0.128	1688.	0.006	259.4	432.2	79.32	12.50	21.06	378
22	0.134	1771.	0.006	271.9	453.0	79.90	12.50	21.05	387
23	0.140	1853.	0.006	284.4	473.9	80.46	12.50	21.03	396
24	0.146	1936.	0.006	296.9	494.7	80.99	12.50	21.02	405
25	0.153	2019.	0.006	309.4	515.6	81.50	12.50	21.01	413
26	0.159	2102.	0.006	321.9	536.4	81.99	12.50	21.00	421
27	0.165	2184.	0.006	334.3	557.2	82.46	12.49	20.99	429
28	0.171	2267.	0.006	346.8	578.1	82.92	12.49	20.98	437
29	0.177	2349.	0.006	359.3	598.9	83.36	12.49	20.97	445
30	0.184	2432.	0.006	371.8	619.8	83.78	12.49	20.96	453
31	0.190	2515.	0.006	384.3	640.6	84.19	12.49	20.96	460
32	0.196	2597.	0.006	396.8	661.4	84.59	12.49	20.95	468
33	0.202	2680.	0.006	409.3	682.3	84.97	12.49	20.95	475
34	0.208	2762.	0.006	421.8	703.1	85.34	12.49	20.94	482
35	0.214	2845.	0.006	434.3	723.9	85.71	12.49	20.94	490
36	0.221	2928.	0.006	446.8	744.8	86.06	12.49	20.93	497
37	0.227	3010.	0.006	459.3	765.6	86.40	12.50	20.93	503
38	0.233	3093.	0.006	471.8	786.4	86.73	12.50	20.93	510
39	0.239	3175.	0.006	484.3	807.3	87.06	12.50	20.93	517
40	0.245	3258.	0.006	496.8	828.1	87.37	12.51	20.93	523
42	0.258	3423.	0.006	521.8	869.8	87.98	12.52	20.93	536
44	0.270	3588.	0.006	546.9	911.5	88.57	12.54	20.95	549
46	0.282	3753.	0.006	572.0	953.3	89.13	12.56	20.97	561
48	0.295	3918.	0.006	597.1	995.1	89.66	12.60	21.00	573
50	0.307	4082.	0.006	622.4	1037.0	90.18	12.64	21.04	584
55	0.338	4495.	0.006	686.0	1142.3	91.39	12.82	21.20	611
60	0.369	4907.	0.006	750.7	1248.7	92.51	13.09	21.47	636
65	0.399	5319.	0.006	817.1	1356.8	93.58	13.48	21.85	658
70	0.430	5731.	0.006	885.7	1467.1	94.59	13.98	22.35	679
75	0.461	6143.	0.006	957.1	1580.1	95.58	14.60	22.96	697
80	0.492	6555.	0.006	1031.9	1696.6	96.54	15.31	23.67	714
85	0.523	6967.	0.006	1110.4	1816.7	97.50	16.10	24.46	729
90	0.554	7379.	0.006	1193.0	1941.0	98.44	16.95	25.30	744
95	0.585	7791.	0.006	1279.9	2069.6	99.38	17.82	26.17	758
100	0.615	8203.	0.006	1371.2	2202.5	100.32	18.69	27.04	772
0.0001 GMOLE/CM^3 ISOCHORE									
• 14.777	0.118	1157.	0.008	180.5	300.6	72.51	12.56	21.45	315
15	0.120	1176.	0.008	183.3	305.3	72.70	12.56	21.43	318
16	0.129	1260.	0.008	195.9	326.2	73.51	12.54	21.35	328
17	0.137	1343.	0.008	208.4	347.2	74.27	12.53	21.30	339
18	0.145	1427.	0.008	221.0	368.1	74.99	12.52	21.25	349
19	0.153	1510.	0.008	233.5	389.0	75.67	12.52	21.22	359
20	0.162	1593.	0.008	246.0	409.8	76.31	12.51	21.19	368
21	0.170	1676.	0.008	258.5	430.7	76.92	12.51	21.16	377
22	0.178	1759.	0.008	271.0	451.6	77.50	12.51	21.14	387
23	0.186	1842.	0.008	283.5	472.5	78.06	12.51	21.12	395
24	0.195	1925.	0.008	296.0	493.3	78.59	12.51	21.10	404
25	0.203	2008.	0.008	308.5	514.2	79.10	12.50	21.09	413
26	0.211	2091.	0.008	321.0	535.1	79.59	12.50	21.07	421
27	0.219	2174.	0.008	333.5	555.9	80.06	12.50	21.06	429
28	0.228	2257.	0.008	346.0	576.8	80.52	12.50	21.05	437
29	0.236	2339.	0.008	358.5	597.6	80.95	12.50	21.04	445
30	0.244	2422.	0.008	371.0	618.5	81.38	12.50	21.03	453
31	0.252	2505.	0.008	383.5	639.3	81.79	12.50	21.02	460
32	0.261	2588.	0.008	396.0	660.2	82.19	12.50	21.01	468
33	0.269	2671.	0.008	408.5	681.0	82.57	12.50	21.00	475
34	0.277	2753.	0.008	421.0	701.9	82.94	12.50	20.99	482
35	0.285	2836.	0.008	433.5	722.7	83.31	12.50	20.99	489
36	0.294	2919.	0.008	446.0	743.6	83.66	12.50	20.98	496
37	0.302	3001.	0.008	458.5	764.4	84.00	12.50	20.98	503
38	0.310	3084.	0.008	471.0	785.3	84.33	12.50	20.97	510
39	0.318	3167.	0.008	483.5	806.1	84.66	12.51	20.97	517
40	0.327	3249.	0.008	496.1	827.0	84.97	12.51	20.97	523
42	0.343	3415.	0.008	521.1	868.7	85.59	12.52	20.97	536
44	0.360	3580.	0.008	546.2	910.4	86.17	12.54	20.98	549
46	0.376	3745.	0.008	571.3	952.2	86.73	12.57	21.00	561
48	0.392	3910.	0.008	596.4	994.1	87.26	12.60	21.03	573
50	0.409	4074.	0.008	621.7	1036.0	87.78	12.65	21.07	584
55	0.450	4489.	0.008	685.3	1141.4	88.99	12.82	21.23	611
60	0.491	4901.	0.008	750.0	1247.8	90.12	13.09	21.50	636
65	0.532	5314.	0.008	816.4	1355.9	91.18	13.48	21.88	658
70	0.574	5727.	0.008	885.1	1466.2	92.20	13.99	22.37	679
75	0.615	6139.	0.008	956.5	1579.3	93.18	14.60	22.98	697
80	0.656	6552.	0.008	1031.2	1695.8	94.15	15.32	23.69	714
85	0.697	6965.	0.008	1109.8	1816.0	95.10	16.11	24.48	729
90	0.738	7377.	0.008	1192.4	1940.3	96.04	16.95	25.32	744
95	0.779	7790.	0.008	1279.3	2068.9	96.98	17.82	26.18	758
100	0.820	8203.	0.008	1370.6	2201.9	97.92	18.70	27.06	772

• TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3 ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0002 GMOLE/CM^3 ISOCHORE									
* 16.454	0.259	1244.	0.017	197.7	329.2	68.03	12.69	22.06	330
17	0.269	1290.	0.017	204.6	340.7	68.44	12.66	21.97	335
18	0.285	1375.	0.017	217.3	361.8	69.16	12.62	21.83	346
19	0.302	1460.	0.017	229.9	382.9	69.85	12.60	21.73	356
20	0.319	1545.	0.017	242.5	403.9	70.49	12.58	21.65	366
21	0.335	1629.	0.017	255.1	424.9	71.10	12.57	21.58	375
22	0.352	1713.	0.017	267.6	445.9	71.69	12.56	21.53	384
23	0.368	1797.	0.017	280.2	466.8	72.25	12.55	21.48	393
24	0.385	1881.	0.017	292.7	487.8	72.78	12.54	21.44	402
25	0.402	1965.	0.017	305.3	508.7	73.29	12.54	21.40	411
26	0.418	2048.	0.017	317.8	529.7	73.78	12.54	21.37	419
27	0.435	2132.	0.017	330.3	550.6	74.26	12.53	21.34	427
28	0.451	2216.	0.017	342.9	571.5	74.71	12.53	21.32	435
29	0.468	2299.	0.017	355.4	592.4	75.15	12.53	21.29	443
30	0.484	2383.	0.017	367.9	613.4	75.58	12.53	21.27	451
31	0.501	2466.	0.017	380.5	634.3	75.99	12.53	21.25	459
32	0.518	2550.	0.017	393.0	655.2	76.39	12.52	21.23	466
33	0.534	2633.	0.017	405.5	676.1	76.77	12.52	21.22	474
34	0.551	2717.	0.017	418.0	697.0	77.15	12.52	21.20	481
35	0.567	2800.	0.017	430.5	717.9	77.51	12.52	21.19	488
36	0.584	2883.	0.017	443.1	738.8	77.86	12.52	21.17	495
37	0.600	2967.	0.017	455.6	759.7	78.20	12.52	21.16	502
38	0.617	3050.	0.017	468.1	780.6	78.54	12.52	21.15	509
39	0.633	3133.	0.017	480.6	801.5	78.86	12.53	21.14	516
40	0.650	3217.	0.017	493.2	822.4	79.18	12.53	21.14	522
42	0.683	3383.	0.017	518.2	864.2	79.79	12.54	21.13	535
44	0.716	3550.	0.017	543.3	906.1	80.38	12.56	21.13	548
46	0.749	3716.	0.017	568.5	947.9	80.93	12.58	21.14	560
48	0.782	3882.	0.017	593.7	989.9	81.47	12.61	21.16	572
50	0.815	4049.	0.017	618.9	1031.9	81.99	12.66	21.20	584
55	0.898	4464.	0.017	682.6	1137.4	83.20	12.83	21.34	611
60	0.980	4879.	0.017	747.4	1244.1	84.33	13.10	21.59	636
65	1.063	5295.	0.017	813.9	1352.3	85.39	13.49	21.96	658
70	1.145	5710.	0.017	882.5	1462.8	86.41	13.99	22.45	679
75	1.228	6125.	0.017	954.0	1576.1	87.39	14.61	23.06	697
80	1.310	6540.	0.017	1028.8	1692.7	88.36	15.32	23.76	714
85	1.393	6954.	0.017	1107.3	1813.0	89.31	16.11	24.54	730
90	1.475	7369.	0.016	1190.0	1937.5	90.26	16.95	25.38	745
95	1.558	7784.	0.016	1276.9	2066.2	91.20	17.82	26.24	759
100	1.640	8198.	0.016	1368.2	2199.3	92.13	18.70	27.11	773
0.0003 GMOLE/CM^3 ISOCHORE									
* 17.598	0.410	1289.	0.025	208.4	346.9	65.44	12.80	22.63	338
18	0.420	1324.	0.025	213.5	355.4	65.72	12.77	22.53	343
19	0.445	1410.	0.025	226.2	376.7	66.41	12.71	22.32	353
20	0.471	1496.	0.025	238.9	397.9	67.06	12.66	22.17	363
21	0.496	1582.	0.025	251.6	419.0	67.68	12.64	22.04	372
22	0.521	1667.	0.025	264.2	440.1	68.27	12.61	21.95	382
23	0.546	1752.	0.025	276.8	461.2	68.83	12.60	21.87	391
24	0.571	1837.	0.025	289.4	482.2	69.36	12.59	21.80	400
25	0.596	1921.	0.025	302.0	503.2	69.88	12.58	21.74	409
26	0.621	2006.	0.025	314.5	524.3	70.37	12.57	21.69	417
27	0.646	2091.	0.025	327.1	545.3	70.85	12.57	21.64	425
28	0.671	2175.	0.025	339.7	566.3	71.30	12.56	21.60	434
29	0.696	2259.	0.025	352.2	587.3	71.74	12.56	21.56	442
30	0.721	2344.	0.025	364.8	608.2	72.17	12.56	21.53	449
31	0.746	2428.	0.025	377.4	629.2	72.58	12.55	21.49	457
32	0.771	2512.	0.025	389.9	650.2	72.98	12.55	21.46	465
33	0.796	2596.	0.025	402.5	671.2	73.37	12.55	21.44	472
34	0.821	2680.	0.025	415.0	692.1	73.74	12.55	21.41	480
35	0.845	2764.	0.025	427.6	713.1	74.10	12.54	21.39	487
36	0.870	2848.	0.025	440.1	734.1	74.46	12.54	21.37	494
37	0.895	2932.	0.025	452.6	755.0	74.80	12.54	21.35	501
38	0.920	3016.	0.025	465.2	776.0	75.14	12.54	21.33	508
39	0.945	3100.	0.025	477.7	796.9	75.46	12.54	21.32	515
40	0.970	3184.	0.025	490.3	817.9	75.78	12.55	21.31	521
42	1.020	3352.	0.025	515.4	859.8	76.39	12.56	21.29	534
44	1.069	3519.	0.025	540.5	901.7	76.98	12.57	21.28	547
46	1.119	3687.	0.025	565.7	943.7	77.54	12.60	21.28	560
48	1.169	3854.	0.025	590.9	985.7	78.07	12.63	21.30	572
50	1.219	4022.	0.025	616.2	1027.8	78.59	12.67	21.32	583
55	1.343	4440.	0.025	679.9	1133.5	79.80	12.84	21.45	611
60	1.467	4858.	0.025	744.8	1240.3	80.93	13.11	21.69	636
65	1.591	5275.	0.025	811.3	1348.7	82.00	13.50	22.05	658
70	1.715	5693.	0.025	880.0	1459.4	83.01	14.00	22.53	679
75	1.840	6110.	0.025	951.5	1572.8	84.00	14.62	23.13	697
80	1.964	6527.	0.025	1026.3	1689.6	84.97	15.33	23.83	714
85	2.088	6944.	0.025	1104.9	1810.0	85.92	16.12	24.60	730
90	2.212	7361.	0.025	1187.5	1934.6	86.86	16.96	25.43	745
95	2.336	7778.	0.025	1274.5	2063.5	87.80	17.83	26.29	759
100	2.460	8195.	0.025	1365.8	2196.7	88.74	18.70	27.16	773

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3 ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0004 GMOLE/CM^3 ISOCHORE									
* 18.493	0.567	1315.	0.034	216.0	359.5	63.61	12.90	23.17	345
19	0.584	1360.	0.034	222.5	370.4	63.96	12.85	23.00	350
20	0.618	1447.	0.034	235.3	391.8	64.61	12.77	22.75	360
21	0.652	1534.	0.034	248.0	413.1	65.23	12.72	22.56	370
22	0.685	1621.	0.034	260.7	434.3	65.83	12.68	22.40	379
23	0.719	1707.	0.034	273.4	455.5	66.39	12.66	22.28	389
24	0.752	1793.	0.034	286.1	476.6	66.93	12.64	22.18	398
25	0.786	1878.	0.034	298.7	497.8	67.44	12.62	22.09	406
26	0.819	1964.	0.033	311.3	518.9	67.94	12.61	22.01	415
27	0.853	2049.	0.033	323.9	539.9	68.41	12.60	21.95	424
28	0.886	2135.	0.033	336.5	561.0	68.87	12.60	21.89	432
29	0.920	2220.	0.033	349.1	582.1	69.31	12.59	21.84	440
30	0.953	2305.	0.033	361.7	603.1	69.74	12.59	21.79	448
31	0.987	2390.	0.033	374.3	624.2	70.15	12.58	21.74	456
32	1.020	2475.	0.033	386.8	645.2	70.55	12.58	21.70	463
33	1.053	2560.	0.033	399.4	666.3	70.94	12.57	21.67	471
34	1.087	2644.	0.033	412.0	687.3	71.31	12.57	21.63	478
35	1.120	2729.	0.033	424.6	708.3	71.68	12.57	21.60	486
36	1.153	2814.	0.033	437.1	729.3	72.03	12.56	21.57	493
37	1.187	2898.	0.033	449.7	750.3	72.38	12.56	21.54	500
38	1.220	2983.	0.033	462.3	771.3	72.71	12.56	21.52	507
39	1.253	3067.	0.033	474.8	792.3	73.04	12.56	21.50	514
40	1.287	3152.	0.033	487.4	813.3	73.36	12.56	21.48	520
42	1.353	3321.	0.033	512.5	855.3	73.97	12.57	21.45	534
44	1.420	3490.	0.033	537.7	897.4	74.55	12.59	21.43	546
46	1.486	3658.	0.033	562.9	939.4	75.11	12.61	21.42	559
48	1.553	3827.	0.033	588.1	981.5	75.65	12.64	21.43	571
50	1.620	3995.	0.033	613.5	1023.7	76.17	12.69	21.45	583
55	1.786	4416.	0.033	677.3	1129.6	77.39	12.85	21.57	610
60	1.952	4836.	0.033	742.2	1236.6	78.51	13.12	21.79	635
65	2.118	5256.	0.033	808.7	1345.2	79.58	13.51	22.14	658
70	2.284	5676.	0.033	877.4	1456.0	80.60	14.01	22.62	679
75	2.450	6096.	0.033	949.0	1569.6	81.58	14.62	23.21	697
80	2.616	6515.	0.033	1023.8	1686.5	82.55	15.33	23.90	714
85	2.782	6935.	0.033	1102.4	1807.1	83.50	16.12	24.67	730
90	2.948	7354.	0.033	1185.1	1931.8	84.45	16.96	25.49	745
95	3.114	7773.	0.033	1272.1	2060.8	85.39	17.83	26.35	760
100	3.279	8192.	0.033	1363.5	2194.2	86.33	18.71	27.21	774
0.0005 GMOLE/CM^3 ISOCHORE									
* 19.243	0.728	1331.	0.043	221.8	369.4	62.20	12.99	23.68	349
20	0.760	1399.	0.043	231.6	385.7	62.70	12.90	23.40	357
21	0.803	1487.	0.042	244.5	407.1	63.32	12.82	23.12	367
22	0.845	1575.	0.042	257.3	428.5	63.92	12.76	22.90	377
23	0.887	1662.	0.042	270.0	449.8	64.49	12.72	22.72	386
24	0.929	1749.	0.042	282.7	471.1	65.03	12.69	22.58	396
25	0.972	1836.	0.042	295.4	492.3	65.54	12.67	22.46	404
26	1.014	1923.	0.042	308.0	513.5	66.04	12.65	22.36	413
27	1.056	2008.	0.042	320.7	534.6	66.52	12.64	22.27	422
28	1.098	2094.	0.042	333.3	555.8	66.98	12.63	22.19	430
29	1.140	2180.	0.042	346.0	576.9	67.42	12.62	22.12	438
30	1.182	2266.	0.042	358.6	598.1	67.85	12.62	22.06	446
31	1.224	2352.	0.042	371.2	619.2	68.26	12.61	22.00	454
32	1.266	2438.	0.042	383.8	640.3	68.66	12.60	21.95	462
33	1.308	2523.	0.042	396.4	661.4	69.05	12.60	21.90	469
34	1.349	2609.	0.042	409.0	682.4	69.43	12.59	21.85	477
35	1.391	2694.	0.042	421.6	703.5	69.79	12.59	21.81	484
36	1.433	2779.	0.042	434.2	724.6	70.14	12.59	21.77	492
37	1.475	2864.	0.042	446.8	745.6	70.49	12.58	21.74	499
38	1.517	2950.	0.042	459.3	766.7	70.83	12.58	21.71	506
39	1.559	3035.	0.042	471.9	787.8	71.15	12.58	21.68	513
40	1.600	3120.	0.042	484.5	808.8	71.47	12.58	21.65	519
42	1.684	3290.	0.042	509.7	850.9	72.08	12.59	21.61	533
44	1.767	3460.	0.042	534.9	893.0	72.67	12.60	21.58	546
46	1.851	3630.	0.042	560.1	935.2	73.23	12.62	21.57	558
48	1.934	3799.	0.042	585.4	977.4	73.77	12.66	21.56	570
50	2.018	3969.	0.042	610.7	1019.6	74.29	12.70	21.58	582
55	2.226	4392.	0.042	674.6	1125.7	75.50	12.86	21.68	610
60	2.434	4815.	0.042	739.6	1232.9	76.63	13.13	21.89	635
65	2.643	5238.	0.042	806.1	1341.7	77.70	13.52	22.23	658
70	2.851	5660.	0.042	874.9	1452.6	78.72	14.02	22.70	679
75	3.059	6082.	0.042	946.5	1566.3	79.71	14.63	23.28	697
80	3.267	6504.	0.042	1021.4	1683.4	80.67	15.34	23.96	715
85	3.475	6925.	0.042	1100.0	1804.2	81.63	16.13	24.73	731
90	3.683	7347.	0.042	1182.7	1929.0	82.57	16.97	25.55	746
95	3.891	7768.	0.042	1269.7	2058.2	83.51	17.84	26.40	760
100	4.098	8189.	0.042	1361.1	2191.7	84.45	18.71	27.26	774

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE	PRESSURE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE	INTERNAL ENERGY	ENTHALPY	ENTROPY	C_v, HEAT CAPACITY	C_p, HEAT CAPACITY	VELOCITY OF SOUND
DEG. KELVIN	ATM	CM^3ATM/GMOLE	ATM/K	J/GMOLE	J/GMOLE	J/GMOLE-K	J/GMOLE-K	J/GMOLE-K	METER/SEC
0.00075 GMOLE/CM^3 ISOCHORE									
* 20.725	1.142	1343.	0.065	231.8	386.1	59.63	13.17	24.92	357
21	1.160	1369.	0.065	235.4	392.1	59.81	13.13	24.77	360
22	1.224	1460.	0.065	248.5	413.9	60.41	13.00	24.32	371
23	1.289	1551.	0.064	261.4	435.5	60.99	12.91	23.98	381
24	1.353	1640.	0.064	274.3	457.1	61.54	12.84	23.70	390
25	1.417	1729.	0.064	287.1	478.6	62.06	12.80	23.48	399
26	1.481	1818.	0.064	299.9	500.0	62.56	12.76	23.30	408
27	1.545	1907.	0.064	312.6	521.4	63.04	12.74	23.14	417
28	1.609	1995.	0.064	325.4	542.7	63.51	12.72	23.00	426
29	1.673	2083.	0.064	338.1	564.1	63.95	12.71	22.88	434
30	1.736	2171.	0.064	350.8	585.4	64.38	12.70	22.78	442
31	1.800	2258.	0.064	363.5	606.6	64.80	12.68	22.68	450
32	1.863	2346.	0.064	376.2	627.9	65.20	12.68	22.59	458
33	1.927	2433.	0.063	388.8	649.2	65.59	12.67	22.51	466
34	1.990	2520.	0.063	401.5	670.4	65.97	12.66	22.43	474
35	2.054	2607.	0.063	414.1	691.6	66.34	12.65	22.36	481
36	2.117	2694.	0.063	426.8	712.8	66.69	12.64	22.30	489
37	2.181	2781.	0.063	439.4	734.0	67.04	12.64	22.24	496
38	2.244	2868.	0.063	452.1	755.2	67.38	12.63	22.19	503
39	2.307	2954.	0.063	464.7	776.4	67.70	12.63	22.15	510
40	2.370	3041.	0.063	477.3	797.6	68.02	12.63	22.10	517
42	2.497	3214.	0.063	502.6	839.9	68.64	12.63	22.03	531
44	2.623	3387.	0.063	527.8	882.2	69.23	12.64	21.97	544
46	2.749	3559.	0.063	553.1	924.6	69.79	12.66	21.93	557
48	2.876	3732.	0.063	578.5	967.0	70.33	12.69	21.91	569
50	3.002	3904.	0.063	603.9	1009.5	70.85	12.73	21.90	581
55	3.317	4334.	0.063	667.9	1116.0	72.07	12.89	21.96	609
60	3.632	4763.	0.063	733.0	1223.7	73.20	13.16	22.15	635
65	3.946	5192.	0.063	799.7	1332.8	74.27	13.54	22.46	658
70	4.261	5620.	0.063	868.6	1444.2	75.29	14.03	22.90	679
75	4.575	6048.	0.063	940.2	1558.3	76.28	14.64	23.47	698
80	4.889	6476.	0.063	1015.2	1675.7	77.24	15.35	24.14	715
85	5.203	6903.	0.063	1093.9	1796.9	78.20	16.14	24.89	731
90	5.517	7330.	0.063	1176.7	1922.1	79.14	16.98	25.70	747
95	5.831	7757.	0.063	1263.7	2051.5	80.09	17.85	26.54	761
100	6.145	8184.	0.063	1355.2	2185.4	81.02	18.72	27.39	776
0.0010 GMOLE/CM^3 ISOCHORE									
* 21.887	1.566	1335.	0.088	238.0	396.7	57.81	13.32	26.13	363
22	1.575	1346.	0.088	239.5	399.1	57.88	13.30	26.06	364
23	1.663	1440.	0.087	252.7	421.2	58.47	13.13	25.46	375
24	1.750	1533.	0.087	265.8	443.1	59.02	13.02	25.01	385
25	1.836	1624.	0.087	278.8	464.9	59.55	12.95	24.64	394
26	1.923	1716.	0.086	291.7	486.6	60.06	12.89	24.35	404
27	2.009	1806.	0.086	304.6	508.2	60.55	12.85	24.10	413
28	2.095	1897.	0.086	317.4	529.7	61.01	12.82	23.90	422
29	2.181	1987.	0.086	330.2	551.2	61.46	12.80	23.71	430
30	2.267	2077.	0.086	343.0	572.7	61.90	12.78	23.55	439
31	2.353	2166.	0.086	355.8	594.2	62.31	12.76	23.41	447
32	2.439	2255.	0.086	368.5	615.6	62.72	12.75	23.28	455
33	2.524	2344.	0.085	381.3	637.0	63.11	12.74	23.16	463
34	2.610	2433.	0.085	394.0	658.4	63.49	12.72	23.05	471
35	2.695	2522.	0.085	406.7	679.8	63.86	12.71	22.95	478
36	2.780	2610.	0.085	419.4	701.1	64.22	12.70	22.86	486
37	2.865	2699.	0.085	432.1	722.5	64.57	12.69	22.77	493
38	2.951	2787.	0.085	444.8	743.8	64.90	12.68	22.70	501
39	3.036	2875.	0.085	457.5	765.1	65.23	12.67	22.63	508
40	3.121	2963.	0.085	470.2	786.4	65.55	12.67	22.57	515
42	3.291	3139.	0.085	495.5	829.0	66.17	12.67	22.46	529
44	3.461	3315.	0.085	520.9	871.5	66.76	12.68	22.37	542
46	3.631	3490.	0.085	546.2	914.1	67.33	12.69	22.31	555
48	3.800	3666.	0.085	571.6	956.7	67.87	12.72	22.26	568
50	3.970	3841.	0.085	597.1	999.4	68.39	12.76	22.23	580
55	4.393	4277.	0.085	661.3	1106.4	69.61	12.92	22.25	609
60	4.816	4713.	0.085	726.5	1214.5	70.75	13.18	22.40	634
65	5.239	5148.	0.084	793.3	1324.1	71.81	13.56	22.69	658
70	5.661	5582.	0.084	862.3	1435.9	72.84	14.05	23.11	679
75	6.083	6016.	0.084	934.0	1550.4	73.83	14.66	23.65	698
80	6.505	6449.	0.084	1009.1	1668.1	74.79	15.37	24.31	716
85	6.926	6882.	0.084	1087.8	1789.6	75.75	16.15	25.05	732
90	7.348	7315.	0.084	1170.7	1915.2	76.70	16.99	25.84	748
95	7.769	7748.	0.084	1257.8	2045.0	77.64	17.86	26.68	763
100	8.190	8180.	0.084	1349.3	2179.2	78.58	18.73	27.52	777

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0015 GMOLE/CM^3 ISOCHORE									
* 23.660	2.416	1286.	0.135	244.1	407.3	55.21	13.55	28.62	370
24	2.463	1320.	0.135	248.7	415.0	55.40	13.47	28.30	373
25	2.597	1418.	0.134	262.0	437.5	55.95	13.30	27.51	384
26	2.730	1514.	0.133	275.3	459.7	56.47	13.19	26.89	394
27	2.863	1610.	0.133	288.4	481.8	56.96	13.10	26.39	404
28	2.996	1705.	0.132	301.5	503.9	57.44	13.04	25.97	413
29	3.128	1799.	0.132	314.5	525.8	57.89	13.00	25.62	422
30	3.259	1893.	0.132	327.5	547.7	58.33	12.96	25.32	431
31	3.391	1986.	0.131	340.5	569.5	58.76	12.94	25.05	440
32	3.522	2079.	0.131	353.4	591.3	59.17	12.91	24.81	448
33	3.653	2172.	0.131	366.3	613.0	59.57	12.89	24.60	456
34	3.784	2264.	0.131	379.2	634.7	59.95	12.86	24.40	465
35	3.914	2356.	0.130	392.0	656.4	60.32	12.83	24.21	473
36	4.044	2448.	0.130	404.8	678.0	60.69	12.81	24.05	481
37	4.175	2539.	0.130	417.6	699.6	61.04	12.79	23.91	488
38	4.305	2631.	0.130	430.4	721.2	61.38	12.78	23.78	496
39	4.435	2722.	0.130	443.2	742.8	61.71	12.77	23.66	504
40	4.565	2813.	0.130	456.0	764.3	62.03	12.76	23.55	511
42	4.824	2995.	0.130	481.5	807.3	62.65	12.75	23.37	525
44	5.083	3176.	0.130	507.0	850.3	63.25	12.75	23.21	539
46	5.342	3357.	0.129	532.5	893.3	63.81	12.76	23.09	553
48	5.601	3538.	0.129	558.0	936.3	64.36	12.78	22.99	565
50	5.859	3718.	0.129	583.6	979.4	64.88	12.82	22.92	578
55	6.504	4168.	0.129	648.1	1087.4	66.11	12.97	22.85	607
60	7.148	4617.	0.129	713.5	1196.4	67.25	13.23	22.92	634
65	7.791	5064.	0.129	780.5	1306.9	68.32	13.60	23.15	658
70	8.434	5511.	0.128	849.7	1419.4	69.35	14.09	23.52	680
75	9.076	5957.	0.128	921.6	1534.7	70.34	14.69	24.03	700
80	9.717	6402.	0.128	996.8	1653.2	71.31	15.40	24.65	718
85	10.358	6846.	0.128	1075.7	1775.4	72.26	16.18	25.36	734
90	10.999	7291.	0.128	1158.7	1901.7	73.21	17.01	26.14	750
95	11.639	7735.	0.128	1245.9	2032.2	74.16	17.88	26.95	765
100	12.280	8178.	0.128	1337.5	2167.0	75.09	18.75	27.77	780
0.0020 GMOLE/CM^3 ISOCHORE									
* 25.018	3.258	1218.	0.184	245.4	410.4	53.32	13.74	31.33	374
26	3.438	1318.	0.183	258.8	433.0	53.84	13.54	30.18	384
27	3.620	1419.	0.181	272.2	455.6	54.35	13.40	29.27	395
28	3.801	1519.	0.181	285.6	478.2	54.84	13.30	28.54	405
29	3.981	1617.	0.180	298.8	500.6	55.30	13.23	27.93	414
30	4.161	1715.	0.179	312.0	522.9	55.75	13.17	27.42	424
31	4.340	1812.	0.179	325.2	545.1	56.18	13.13	26.98	433
32	4.519	1909.	0.178	338.3	567.2	56.60	13.09	26.59	442
33	4.697	2005.	0.178	351.4	589.3	57.00	13.05	26.24	450
34	4.875	2101.	0.177	364.4	611.4	57.39	13.00	25.92	459
35	5.052	2196.	0.177	377.4	633.3	57.77	12.96	25.63	467
36	5.229	2291.	0.177	390.3	655.3	58.13	12.93	25.38	475
37	5.406	2386.	0.177	403.3	677.1	58.48	12.90	25.16	484
38	5.582	2480.	0.176	416.1	698.9	58.83	12.87	24.96	492
39	5.759	2574.	0.176	429.0	720.7	59.16	12.86	24.78	499
40	5.935	2668.	0.176	441.9	742.5	59.49	12.84	24.61	507
42	6.287	2856.	0.176	467.5	786.0	60.11	12.82	24.33	522
44	6.638	3043.	0.176	493.2	829.4	60.71	12.82	24.10	536
46	6.989	3230.	0.175	518.8	872.9	61.28	12.83	23.91	550
48	7.339	3416.	0.175	544.5	916.3	61.83	12.84	23.76	563
50	7.689	3602.	0.175	570.2	959.7	62.35	12.88	23.63	576
55	8.563	4065.	0.174	634.9	1068.7	63.59	13.02	23.46	607
60	9.434	4527.	0.174	700.6	1178.6	64.73	13.27	23.45	634
65	10.304	4987.	0.174	767.9	1289.9	65.80	13.64	23.62	659
70	11.173	5446.	0.174	837.2	1403.3	66.83	14.12	23.94	681
75	12.041	5904.	0.173	909.3	1519.3	67.83	14.72	24.41	701
80	12.908	6361.	0.173	984.6	1638.6	68.80	15.42	24.99	720
85	13.774	6817.	0.173	1063.7	1761.5	69.76	16.20	25.68	737
90	14.640	7273.	0.173	1146.8	1888.4	70.71	17.04	26.43	753
95	15.505	7729.	0.173	1234.1	2019.6	71.65	17.90	27.22	769
100	16.370	8184.	0.173	1325.8	2155.1	72.59	18.77	28.02	784

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE	PRESSURE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE	INTERNAL ENERGY	ENTHALPY	ENTROPY	C_v, HEAT CAPACITY	C_p, HEAT CAPACITY	VELOCITY OF SOUND
DEG. KELVIN	ATM	CM^3ATM/GMOLE	ATM/K	J/GMOLE	J/GMOLE	J/GMOLE-K	J/GMOLE-K	J/GMOLE-K	METER/SEC
0.0025 GMOLE/CM^3 ISOCHORE									
* 26.119	4.077	1140.	0.234	243.8	409.1	51.82	13.92	34.35	376
27	4.283	1233.	0.233	256.0	429.6	52.28	13.73	32.99	386
28	4.515	1338.	0.231	269.7	452.7	52.77	13.58	31.75	396
29	4.746	1441.	0.230	283.2	475.5	53.25	13.48	30.76	407
30	4.975	1543.	0.229	296.6	498.3	53.70	13.40	29.94	416
31	5.204	1645.	0.228	310.0	520.9	54.14	13.33	29.25	426
32	5.432	1745.	0.227	323.3	543.5	54.56	13.28	28.65	435
33	5.659	1845.	0.227	336.6	566.0	54.97	13.23	28.13	444
34	5.885	1944.	0.226	349.8	588.3	55.37	13.16	27.64	453
35	6.111	2042.	0.225	362.9	610.6	55.75	13.09	27.22	462
36	6.336	2140.	0.225	376.0	632.8	56.11	13.04	26.85	471
37	6.561	2238.	0.225	389.0	654.9	56.47	13.00	26.53	479
38	6.786	2336.	0.224	402.0	677.0	56.82	12.97	26.24	487
39	7.010	2433.	0.224	414.9	699.1	57.15	12.94	25.99	495
40	7.234	2530.	0.224	427.9	721.1	57.48	12.92	25.76	503
42	7.681	2723.	0.223	453.7	765.0	58.11	12.89	25.37	519
44	8.127	2916.	0.223	479.5	808.9	58.71	12.88	25.04	534
46	8.573	3108.	0.223	505.2	852.7	59.28	12.89	24.78	548
48	9.018	3300.	0.222	531.0	896.5	59.83	12.90	24.56	562
50	9.462	3491.	0.222	556.9	940.4	60.36	12.93	24.38	575
55	10.571	3968.	0.221	621.8	1050.3	61.60	13.07	24.09	606
60	11.676	4443.	0.221	687.8	1161.1	62.75	13.32	24.00	634
65	12.779	4916.	0.220	755.3	1273.2	63.83	13.68	24.09	660
70	13.881	5387.	0.220	824.8	1387.4	64.86	14.16	24.36	683
75	14.981	5857.	0.220	897.0	1504.2	65.85	14.75	24.79	703
80	16.079	6327.	0.220	972.5	1624.2	66.83	15.45	25.34	722
85	17.177	6795.	0.219	1051.7	1747.9	67.79	16.23	25.99	740
90	18.274	7263.	0.219	1134.9	1875.5	68.74	17.06	26.72	756
95	19.369	7730.	0.219	1222.3	2007.4	69.68	17.92	27.49	772
100	20.465	8197.	0.219	1314.1	2143.6	70.62	18.79	28.27	787
0.0030 GMOLE/CM^3 ISOCHORE									
* 27.041	4.866	1058.	0.287	240.3	404.6	50.55	14.10	37.80	377
28	5.140	1163.	0.285	253.7	427.3	51.04	13.90	35.86	388
29	5.424	1271.	0.283	267.6	450.7	51.53	13.75	34.28	399
30	5.706	1378.	0.281	281.3	474.0	51.99	13.64	33.01	409
31	5.986	1483.	0.280	294.9	497.0	52.44	13.56	31.96	419
32	6.265	1587.	0.278	308.4	520.0	52.87	13.48	31.07	429
33	6.543	1691.	0.277	321.9	542.9	53.28	13.42	30.30	438
34	6.819	1793.	0.276	335.3	565.6	53.68	13.32	29.60	448
35	7.095	1895.	0.275	348.5	588.2	54.07	13.23	29.00	457
36	7.370	1996.	0.275	361.7	610.7	54.44	13.16	28.49	466
37	7.645	2097.	0.274	374.9	633.1	54.80	13.11	28.04	475
38	7.919	2197.	0.274	388.0	655.4	55.15	13.06	27.65	483
39	8.192	2297.	0.273	401.0	677.7	55.49	13.03	27.30	492
40	8.465	2397.	0.273	414.0	699.9	55.81	13.00	26.99	500
42	9.011	2596.	0.272	440.0	744.3	56.45	12.96	26.47	516
44	9.555	2795.	0.272	465.9	788.6	57.05	12.95	26.04	532
46	10.098	2992.	0.271	491.8	832.8	57.63	12.94	25.68	546
48	10.640	3190.	0.271	517.7	877.0	58.18	12.96	25.39	561
50	11.181	3387.	0.271	543.6	921.3	58.71	12.99	25.15	574
55	12.532	3878.	0.270	608.8	1032.1	59.95	13.12	24.74	606
60	13.878	4365.	0.269	675.1	1143.8	61.10	13.36	24.55	635
65	15.221	4851.	0.268	742.7	1256.8	62.19	13.71	24.57	661
70	16.561	5335.	0.268	812.5	1371.8	63.22	14.19	24.79	684
75	17.899	5818.	0.267	884.9	1489.4	64.22	14.78	25.17	705
80	19.236	6299.	0.267	960.5	1610.2	65.19	15.48	25.68	725
85	20.570	6780.	0.267	1039.8	1734.5	66.15	16.25	26.30	743
90	21.904	7260.	0.267	1123.1	1862.9	67.11	17.08	27.00	759
95	23.237	7739.	0.266	1210.7	1995.5	68.05	17.94	27.75	776
100	24.568	8218.	0.266	1302.5	2132.3	69.00	18.81	28.52	791
0.0035 GMOLE/CM^3 ISOCHORE									
* 27.828	5.619	973.9	0.341	235.3	398.0	49.45	14.30	41.77	378
28	5.679	993.6	0.340	237.8	402.2	49.54	14.25	41.27	380
29	6.018	1107.	0.338	252.0	426.2	50.04	14.06	38.75	392
30	6.354	1218.	0.335	265.9	449.9	50.51	13.91	36.79	402
31	6.688	1327.	0.333	279.8	473.4	50.97	13.80	35.22	413
32	7.020	1436.	0.331	293.5	496.8	51.40	13.70	33.93	423
33	7.351	1543.	0.329	307.3	520.1	51.83	13.63	32.82	432
34	7.680	1648.	0.328	320.8	543.2	52.23	13.49	31.84	442
35	8.007	1752.	0.327	334.3	566.1	52.62	13.38	31.02	452
36	8.333	1858.	0.326	347.6	588.9	53.00	13.29	30.32	462
37	8.659	1961.	0.325	360.9	611.5	53.36	13.22	29.72	471
38	8.984	2065.	0.325	374.0	634.1	53.71	13.16	29.19	480
39	9.308	2168.	0.324	387.2	656.6	54.05	13.11	28.73	489
40	9.632	2270.	0.324	400.3	679.1	54.38	13.08	28.33	497
42	10.278	2475.	0.323	426.4	723.9	55.02	13.03	27.64	514
44	10.923	2679.	0.322	452.4	768.6	55.62	13.00	27.09	530
46	11.566	2883.	0.321	478.4	813.2	56.20	13.00	26.63	545
48	12.209	3086.	0.321	504.4	857.8	56.76	13.01	26.26	560
50	12.850	3288.	0.320	530.5	902.5	57.29	13.04	25.95	574
55	14.449	3793.	0.319	595.9	1014.2	58.54	13.17	25.40	606
60	16.042	4293.	0.318	662.4	1126.9	59.69	13.40	25.11	636
65	17.631	4792.	0.317	730.3	1240.7	60.78	13.75	25.06	662
70	19.217	5289.	0.317	800.2	1356.5	61.81	14.23	25.21	686
75	20.800	5785.	0.316	872.7	1474.9	62.82	14.81	25.54	708
80	22.380	6279.	0.316	948.5	1596.4	63.79	15.51	26.02	728
85	23.958	6773.	0.315	1027.9	1721.5	64.76	16.28	26.61	746
90	25.535	7264.	0.315	1111.4	1850.6	65.71	17.10	27.28	763
95	27.110	7756.	0.315	1199.0	1983.9	66.66	17.96	28.01	780
100	28.684	8247.	0.315	1291.0	2121.4	67.60	18.82	28.76	796

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0040 GMOLE/CM^3 ISOCHORE									
* 28.509	6.334	890.4	0.397	229.3	389.7	48.47	14.50	46.41	378
29	6.531	948.2	0.395	236.4	401.8	48.72	14.38	44.57	384
30	6.924	1064.	0.391	250.7	426.1	49.20	14.20	41.55	396
31	7.314	1178.	0.388	264.8	450.1	49.67	14.06	39.21	406
32	7.701	1290.	0.386	278.8	473.9	50.11	13.94	37.33	417
33	8.087	1401.	0.383	292.8	497.6	50.54	13.84	35.77	427
34	8.469	1510.	0.381	306.5	521.1	50.95	13.67	34.42	437
35	8.850	1618.	0.380	320.1	544.3	51.35	13.53	33.30	447
36	9.229	1725.	0.379	333.6	567.4	51.72	13.41	32.36	457
37	9.607	1832.	0.378	347.0	590.3	52.09	13.32	31.57	467
38	9.984	1938.	0.377	360.3	613.2	52.45	13.25	30.88	476
39	10.361	2044.	0.376	373.5	635.9	52.79	13.20	30.29	486
40	10.737	2150.	0.376	386.6	658.6	53.12	13.15	29.77	495
42	11.487	2360.	0.374	412.9	703.9	53.76	13.09	28.90	512
44	12.235	2570.	0.374	439.0	749.0	54.37	13.06	28.20	528
46	12.981	2779.	0.373	465.1	794.0	54.95	13.05	27.63	544
48	13.727	2988.	0.372	491.2	839.0	55.51	13.06	27.16	559
50	14.471	3196.	0.372	517.4	883.9	56.04	13.08	26.77	573
55	16.326	3714.	0.370	583.1	996.6	57.29	13.22	26.08	607
60	18.172	4228.	0.369	649.9	1110.2	58.45	13.44	25.67	637
65	20.014	4740.	0.368	717.9	1224.9	59.54	13.79	25.54	664
70	21.851	5250.	0.367	788.0	1341.5	60.58	14.26	25.64	689
75	23.685	5758.	0.366	860.7	1460.6	61.58	14.84	25.92	711
80	25.516	6268.	0.366	936.6	1582.9	62.56	15.53	26.35	731
85	27.344	6771.	0.365	1016.1	1708.8	63.53	16.30	26.91	750
90	29.170	7276.	0.365	1099.7	1838.6	64.48	17.12	27.56	767
95	30.994	7779.	0.365	1187.4	1972.5	65.43	17.98	28.26	784
100	32.816	8282.	0.364	1279.5	2110.8	66.38	18.84	28.99	800
0.0045 GMOLE/CM^3 ISOCHORE									
* 29.103	7.007	808.0	0.454	222.3	380.1	47.58	14.71	51.86	378
30	7.419	916.1	0.450	235.4	402.5	48.02	14.51	47.68	389
31	7.867	1034.	0.446	249.8	427.0	48.49	14.33	44.16	400
32	8.311	1150.	0.443	264.1	451.2	48.95	14.19	41.44	411
33	8.753	1265.	0.439	278.4	475.5	49.39	14.07	39.24	421
34	9.191	1378.	0.437	292.3	499.3	49.80	13.85	37.39	432
35	9.626	1489.	0.435	306.1	522.9	50.20	13.68	35.89	443
36	10.060	1599.	0.433	319.7	546.2	50.59	13.54	34.65	454
37	10.492	1708.	0.432	333.2	569.4	50.96	13.43	33.62	464
38	10.923	1818.	0.431	346.6	592.5	51.31	13.34	32.73	473
39	11.353	1927.	0.430	359.9	615.5	51.66	13.28	31.98	483
40	11.783	2035.	0.429	373.1	638.4	51.99	13.22	31.32	492
42	12.639	2251.	0.428	399.5	684.1	52.64	13.15	30.23	510
44	13.494	2466.	0.427	425.8	729.6	53.25	13.11	29.36	527
46	14.346	2681.	0.426	452.0	775.0	53.83	13.10	28.67	543
48	15.197	2895.	0.425	478.2	820.4	54.39	13.10	28.09	559
50	16.047	3109.	0.424	504.4	865.7	54.92	13.13	27.62	573
55	18.164	3647.	0.423	570.3	979.3	56.18	13.26	26.76	608
60	20.271	4182.	0.421	637.4	1093.8	57.35	13.48	26.24	639
65	22.372	4694.	0.420	705.6	1209.3	58.44	13.82	26.03	666
70	24.468	5217.	0.419	775.8	1326.8	59.48	14.29	26.06	691
75	26.559	5738.	0.418	848.7	1446.7	60.48	14.87	26.29	714
80	28.646	6258.	0.417	924.7	1569.7	61.47	15.56	26.69	735
85	30.730	6777.	0.417	1004.4	1696.3	62.43	16.32	27.21	754
90	32.812	7294.	0.416	1088.1	1826.9	63.39	17.15	27.83	771
95	34.891	7810.	0.416	1175.9	1961.5	64.34	18.00	28.51	789
100	36.968	8326.	0.415	1268.1	2100.5	65.28	18.86	29.22	805
0.0050 GMOLE/CM^3 ISOCHORE									
* 29.626	7.640	727.6	0.513	214.7	369.5	46.76	14.93	58.35	378
30	7.842	774.2	0.511	220.2	379.1	46.94	14.84	55.81	383
31	8.350	896.9	0.506	235.0	404.2	47.43	14.63	50.44	394
32	8.853	1017.	0.501	249.5	428.9	47.89	14.45	46.47	405
33	9.353	1135.	0.497	264.1	453.6	48.34	14.32	43.36	416
34	9.848	1251.	0.493	278.3	477.8	48.76	14.05	40.85	428
35	10.340	1366.	0.491	292.2	501.7	49.16	13.84	38.85	439
36	10.829	1479.	0.489	305.9	525.4	49.55	13.67	37.23	450
37	11.317	1592.	0.487	319.6	548.9	49.92	13.54	35.89	460
38	11.803	1704.	0.486	333.0	572.2	50.28	13.44	34.76	471
39	12.289	1815.	0.485	346.4	595.5	50.63	13.36	33.81	481
40	12.773	1926.	0.484	359.8	618.6	50.97	13.29	32.98	490
42	13.739	2148.	0.482	386.2	664.7	51.61	13.21	31.64	509
44	14.702	2369.	0.481	412.6	710.5	52.23	13.16	30.59	526
46	15.663	2589.	0.480	438.9	756.3	52.81	13.14	29.74	543
48	16.623	2809.	0.479	465.2	802.1	53.37	13.15	29.06	559
50	17.581	3028.	0.478	491.5	847.8	53.91	13.17	28.49	574
55	19.968	3574.	0.476	557.7	962.3	55.17	13.31	27.46	609
60	22.342	4115.	0.474	625.0	1077.7	56.34	13.52	26.81	640
65	24.709	4654.	0.473	693.4	1194.1	57.44	13.86	26.51	669
70	27.069	5190.	0.472	763.8	1312.3	58.48	14.32	26.47	694
75	29.424	5725.	0.471	836.8	1433.1	59.49	14.90	26.65	717
80	31.775	6258.	0.470	912.9	1556.9	60.47	15.58	27.01	738
85	34.121	6789.	0.469	992.7	1684.2	61.44	16.35	27.51	758
90	36.465	7320.	0.468	1076.5	1815.5	62.39	17.17	28.10	776
95	38.805	7849.	0.468	1164.5	1950.8	63.35	18.02	28.76	793
100	41.143	8377.	0.467	1256.7	2090.5	64.29	18.88	29.44	810

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0055 GMOLE/CM^3 ISOCHORE									
* 30.087	8.232	649.4	0.573	206.4	358.1	45.99	15.17	66.18	377
31	8.765	765.4	0.567	220.2	381.6	46.44	14.94	58.60	388
32	9.329	889.7	0.562	235.0	406.9	46.91	14.73	52.72	400
33	9.889	1017.	0.556	249.9	432.1	47.37	14.57	48.32	411
34	10.443	1131.	0.552	264.3	456.7	47.80	14.25	44.89	423
35	10.993	1249.	0.548	278.4	480.9	48.21	14.00	42.24	435
36	11.540	1365.	0.546	292.3	504.9	48.60	13.81	40.13	447
37	12.085	1481.	0.544	306.0	528.7	48.98	13.65	38.41	458
38	12.628	1595.	0.542	319.6	552.3	49.34	13.53	36.99	468
39	13.170	1710.	0.541	333.1	575.7	49.69	13.43	35.79	479
40	13.710	1824.	0.540	346.5	599.1	50.03	13.36	34.78	488
42	14.788	2051.	0.538	373.1	645.5	50.68	13.26	33.13	508
44	15.863	2277.	0.537	399.5	691.8	51.29	13.20	31.87	526
46	16.936	2503.	0.536	425.9	737.9	51.88	13.18	30.86	543
48	18.007	2728.	0.535	452.3	784.0	52.44	13.19	30.05	559
50	19.076	2953.	0.534	478.7	830.1	52.98	13.21	29.38	574
55	21.739	3514.	0.532	545.1	945.6	54.24	13.35	28.17	610
60	24.387	4068.	0.529	612.6	1061.9	55.42	13.56	27.38	642
65	27.027	4620.	0.527	681.2	1179.1	56.52	13.89	26.99	672
70	29.659	5170.	0.526	751.8	1298.2	57.56	14.35	26.89	698
75	32.285	5718.	0.525	824.9	1419.7	58.57	14.93	27.02	721
80	34.905	6264.	0.524	901.2	1544.3	59.56	15.61	27.33	743
85	37.521	6809.	0.523	981.1	1672.4	60.53	16.37	27.79	762
90	40.132	7357.	0.522	1065.0	1804.4	61.48	17.19	28.36	781
95	42.741	7894.	0.521	1153.1	1940.5	62.44	18.04	28.99	799
100	45.346	8436.	0.521	1245.4	2080.8	63.38	18.89	29.66	816
0.0060 GMOLE/CM^3 ISOCHORE									
* 30.495	8.782	574.0	0.635	197.7	346.0	45.27	15.41	75.76	377
31	9.116	640.1	0.631	205.4	359.4	45.52	15.27	69.58	383
32	9.744	768.5	0.624	220.6	385.1	46.00	15.02	60.66	395
33	10.366	894.7	0.617	235.8	410.8	46.47	14.84	54.34	406
34	10.980	1017.	0.612	250.4	435.8	46.91	14.47	49.66	419
35	11.589	1138.	0.608	264.7	460.4	47.32	14.17	46.13	431
36	12.195	1257.	0.605	278.8	484.7	47.72	13.94	43.39	443
37	12.799	1376.	0.602	292.6	508.8	48.10	13.76	41.21	455
38	13.400	1493.	0.600	306.3	532.6	48.46	13.62	39.42	466
39	13.999	1610.	0.599	319.9	556.3	48.81	13.51	37.94	477
40	14.597	1727.	0.597	333.3	579.8	49.16	13.42	36.70	487
42	15.790	1959.	0.596	360.1	626.7	49.81	13.31	34.71	507
44	16.980	2191.	0.594	386.6	673.4	50.43	13.25	33.20	525
46	18.167	2423.	0.593	413.1	719.9	51.01	13.22	32.01	543
48	19.352	2654.	0.592	439.5	766.3	51.58	13.23	31.06	560
50	20.535	2884.	0.591	466.0	812.8	52.12	13.25	30.28	576
55	23.482	3459.	0.588	532.6	929.1	53.39	13.39	28.87	612
60	26.411	4027.	0.585	600.4	1046.4	54.57	13.60	27.95	645
65	29.330	4593.	0.583	669.1	1164.4	55.67	13.93	27.46	675
70	32.241	5157.	0.581	739.8	1284.3	56.71	14.38	27.29	701
75	35.144	5718.	0.580	813.1	1406.6	57.73	14.95	27.37	725
80	38.040	6278.	0.579	889.6	1532.0	58.71	15.63	27.65	747
85	40.932	6835.	0.578	969.6	1660.8	59.68	16.39	28.07	767
90	43.818	7392.	0.577	1053.6	1793.5	60.64	17.21	28.61	786
95	46.701	7947.	0.576	1141.7	1930.4	61.59	18.06	29.22	804
100	49.580	8502.	0.576	1234.1	2071.4	62.54	18.91	29.88	822
0.0065 GMCLE/CM^3 ISOCHORE									
* 30.856	9.292	501.4	0.699	188.5	333.3	44.59	15.66	87.73	376
31	9.406	520.8	0.697	190.7	337.4	44.66	15.61	85.04	378
32	10.099	653.4	0.689	206.2	363.6	45.15	15.33	71.01	390
33	10.785	783.5	0.680	221.8	389.9	45.63	15.12	61.77	401
34	11.461	909.4	0.673	236.6	415.3	46.07	14.69	55.32	415
35	12.132	1033.	0.668	251.2	440.3	46.49	14.35	50.63	428
36	12.798	1156.	0.665	265.4	464.9	46.90	14.08	47.09	441
37	13.461	1277.	0.662	279.3	489.2	47.28	13.87	44.31	453
38	14.122	1397.	0.660	293.1	513.3	47.65	13.71	42.09	464
39	14.781	1517.	0.658	306.8	537.2	48.00	13.58	40.26	475
40	15.438	1636.	0.656	320.3	561.0	48.34	13.48	38.75	486
42	16.749	1874.	0.654	347.1	608.2	49.00	13.35	36.36	506
44	18.056	2111.	0.653	373.8	655.2	49.62	13.28	34.58	526
46	19.360	2348.	0.651	400.3	702.1	50.21	13.26	33.20	544
48	20.662	2585.	0.650	426.8	748.9	50.77	13.26	32.09	561
50	21.961	2821.	0.649	453.4	795.7	51.31	13.29	31.19	577
55	25.199	3410.	0.646	520.1	912.9	52.58	13.43	29.58	614
60	28.415	3992.	0.642	588.2	1031.1	53.77	13.64	28.51	648
65	31.621	4572.	0.640	657.1	1150.0	54.87	13.96	27.93	678
70	34.817	5149.	0.638	728.0	1270.7	55.92	14.41	27.69	705
75	38.004	5724.	0.637	801.4	1393.8	56.94	14.98	27.72	730
80	41.184	6298.	0.635	878.0	1520.0	57.92	15.66	27.95	752
85	44.357	6869.	0.634	958.1	1649.6	58.90	16.41	28.35	772
90	47.526	7439.	0.633	1042.2	1783.0	59.86	17.23	28.86	791
95	50.689	8008.	0.632	1130.4	1920.6	60.81	18.07	29.45	810
100	53.849	8575.	0.632	1222.9	2062.4	61.76	18.93	30.08	828

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0070 GMOLE/CM^3 ISOCHORE									
* 31.176	9.761	431.9	0.764	178.9	320.2	43.94	15.92	102.98	375
32	10.398	544.5	0.755	191.9	342.4	44.35	15.66	84.93	385
33	11.150	678.4	0.744	207.8	369.2	44.84	15.42	71.11	397
34	11.890	807.7	0.736	223.0	395.1	45.29	14.92	62.12	411
35	12.624	934.7	0.731	237.7	420.4	45.72	14.53	55.86	425
36	13.352	1060.	0.726	252.1	445.4	46.12	14.22	51.26	438
37	14.076	1184.	0.723	266.2	469.9	46.51	13.98	47.75	451
38	14.798	1307.	0.720	280.1	494.3	46.88	13.80	44.99	463
39	15.517	1429.	0.718	293.8	518.4	47.23	13.65	42.76	474
40	16.234	1551.	0.717	307.4	542.4	47.58	13.54	40.93	485
42	17.665	1795.	0.714	334.3	590.0	48.24	13.40	38.09	506
44	19.092	2037.	0.713	361.0	637.4	48.86	13.32	36.00	526
46	20.517	2280.	0.711	387.6	684.6	49.45	13.29	34.40	545
48	21.938	2522.	0.710	414.2	731.8	50.01	13.29	33.14	562
50	23.357	2764.	0.709	440.8	778.9	50.56	13.32	32.12	579
55	26.893	3368.	0.706	507.8	897.0	51.83	13.47	30.28	617
60	30.404	3963.	0.701	576.1	1016.2	53.02	13.67	29.06	651
65	33.903	4557.	0.699	645.2	1135.9	54.13	13.99	28.39	682
70	37.391	5149.	0.697	716.2	1257.4	55.18	14.44	28.08	709
75	40.869	5737.	0.695	789.8	1381.3	56.20	15.01	28.05	734
80	44.339	6324.	0.693	866.4	1508.3	57.19	15.68	28.25	757
85	47.802	6909.	0.692	946.7	1638.6	58.16	16.43	28.61	778
90	51.258	7493.	0.691	1030.9	1772.8	59.12	17.25	29.10	797
95	54.710	8075.	0.690	1119.2	1911.1	60.08	18.09	29.67	816
100	58.157	8657.	0.689	1211.8	2053.6	61.03	18.94	30.28	834
0.0075 GMOLE/CM^3 ISOCHORE									
* 31.459	10.190	378.1	0.823	169.2	306.8	43.32	16.13	117.58	372
32	10.638	452.3	0.818	177.8	321.5	43.59	15.94	101.25	380
33	11.458	589.4	0.814	194.0	348.8	44.09	15.73	82.56	394
34	12.266	719.7	0.804	209.4	375.1	44.55	15.17	70.22	409
35	13.066	848.7	0.798	224.3	400.9	44.98	14.69	61.96	424
36	13.862	976.3	0.793	238.9	426.1	45.39	14.36	56.18	438
37	14.653	1103.	0.789	253.1	451.0	45.78	14.12	51.75	451
38	15.440	1229.	0.786	267.1	475.7	46.15	13.90	48.36	464
39	16.224	1354.	0.783	280.9	500.1	46.51	13.74	45.58	475
40	17.006	1478.	0.781	294.6	524.3	46.86	13.62	43.32	486
42	18.561	1726.	0.776	321.6	572.4	47.52	13.45	39.87	507
44	20.108	1974.	0.773	348.4	620.1	48.14	13.37	37.36	527
46	21.652	2220.	0.770	375.1	667.6	48.73	13.33	35.47	545
48	23.191	2466.	0.768	401.8	715.1	49.30	13.33	34.02	562
50	24.728	2712.	0.766	428.4	762.5	49.85	13.36	32.86	579
55	28.553	3324.	0.763	495.5	881.3	51.13	13.50	30.86	618
60	32.363	3934.	0.761	564.0	1001.3	52.32	13.70	29.60	654
65	36.168	4544.	0.759	633.3	1121.9	53.43	14.02	28.86	686
70	39.956	5151.	0.757	704.4	1244.2	54.48	14.46	28.50	714
75	43.730	5755.	0.756	778.1	1368.9	55.50	15.03	28.43	740
80	47.500	6359.	0.754	854.9	1496.7	56.49	15.70	28.58	763
85	51.265	6963.	0.752	935.3	1627.9	57.46	16.46	28.89	784
90	55.029	7564.	0.750	1019.6	1763.1	58.43	17.27	29.32	803
95	58.771	8159.	0.748	1108.1	1902.1	59.38	18.12	29.85	822
100	62.501	8753.	0.746	1200.8	2045.2	60.33	18.97	30.41	840
0.0080 GMOLE/CM^3 ISOCHORE									
* 31.709	10.582	322.8	0.888	159.2	293.2	42.72	16.28	138.86	372
32	10.842	363.3	0.885	163.9	301.2	42.87	16.17	125.40	376
33	11.730	502.7	0.881	180.2	328.7	43.37	16.07	96.83	390
34	12.605	635.2	0.870	195.9	355.5	43.84	15.43	79.53	406
35	13.470	766.6	0.863	211.0	381.6	44.28	14.82	68.60	422
36	14.330	896.1	0.858	225.7	407.2	44.69	14.50	61.27	436
37	15.185	1024.	0.853	240.1	432.4	45.09	14.27	55.83	449
38	16.035	1153.	0.850	254.1	457.2	45.46	14.01	51.71	462
39	16.882	1280.	0.847	268.0	481.9	45.82	13.84	48.40	474
40	17.727	1407.	0.844	281.8	506.3	46.17	13.70	45.75	486
42	19.407	1659.	0.839	309.0	554.8	46.84	13.52	41.73	507
44	21.080	1912.	0.835	336.0	602.9	47.46	13.42	38.84	527
46	22.748	2164.	0.832	362.8	650.9	48.06	13.38	36.69	546
48	24.411	2416.	0.830	389.5	698.7	48.63	13.37	35.05	564
50	26.073	2667.	0.828	416.3	746.5	49.17	13.39	33.75	581
55	30.208	3294.	0.825	483.5	866.1	50.46	13.53	31.52	621
60	34.326	3919.	0.823	552.1	986.9	51.65	13.72	30.12	658
65	38.439	4543.	0.821	621.5	1108.3	52.76	14.04	29.29	690
70	42.535	5165.	0.819	692.7	1231.4	53.82	14.49	28.87	719
75	46.614	5783.	0.817	766.5	1356.9	54.83	15.06	28.75	745
80	50.690	6402.	0.815	843.4	1485.5	55.83	15.73	28.86	768
85	54.761	7022.	0.813	924.0	1617.6	56.80	16.49	29.15	790
90	58.829	7637.	0.810	1008.4	1753.5	57.77	17.31	29.56	810
95	62.872	8247.	0.808	1097.1	1893.4	58.73	18.15	30.06	828
100	66.903	8854.	0.806	1190.0	2037.4	59.68	19.01	30.61	847

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0085 GMOLE/CM^3 ISOCHORE									
* 31.928	10.934	277.7	0.954	149.0	279.3	42.15	16.42	165.68	372
32	11.003	287.9	0.953	150.2	281.3	42.19	16.40	160.43	373
33	11.961	423.2	0.950	166.5	309.1	42.69	16.46	115.13	386
34	12.903	558.0	0.936	182.6	336.4	43.17	15.68	90.58	403
35	13.834	691.5	0.928	197.9	362.8	43.61	14.97	76.13	420
36	14.759	823.7	0.922	212.7	388.6	44.03	14.64	66.85	434
37	15.679	955.8	0.917	227.2	414.1	44.43	14.40	60.22	448
38	16.593	1087.	0.915	241.3	439.1	44.81	14.11	55.27	462
39	17.505	1218.	0.911	255.3	464.0	45.17	13.93	51.35	474
40	18.414	1347.	0.908	269.2	488.7	45.52	13.79	48.25	486
42	20.221	1599.	0.903	296.6	537.6	46.19	13.59	43.62	508
44	22.022	1858.	0.899	323.6	586.1	46.82	13.48	40.32	528
46	23.818	2115.	0.896	350.5	634.4	47.42	13.42	37.91	548
48	25.608	2372.	0.894	377.3	682.6	47.99	13.41	36.07	566
50	27.396	2628.	0.892	404.2	730.7	48.53	13.42	34.63	584
55	31.848	3270.	0.888	471.5	851.2	49.82	13.55	32.16	625
60	36.283	3911.	0.886	540.2	972.8	51.01	13.74	30.62	662
65	40.712	4550.	0.884	609.7	1095.0	52.13	14.06	29.70	695
70	45.123	5187.	0.882	681.0	1218.9	53.18	14.51	29.22	725
75	49.514	5820.	0.880	755.0	1345.2	54.20	15.08	29.06	751
80	53.904	6455.	0.877	832.0	1474.6	55.20	15.76	29.14	775
85	58.289	7089.	0.875	912.7	1607.5	56.17	16.52	29.39	796
90	62.668	7719.	0.872	997.3	1744.3	57.14	17.34	29.78	816
95	67.019	8344.	0.870	1086.1	1885.0	58.10	18.19	30.27	835
100	71.358	8968.	0.867	1179.2	2029.8	59.06	19.05	30.80	854
0.0090 GMOLE/CM^3 ISOCHORE									
* 32.120	11.250	230.4	1.030	137.6	264.2	41.57	17.34	202.34	368
33	12.155	351.0	1.016	153.0	289.9	42.04	16.80	138.23	381
34	13.164	488.1	1.004	169.4	317.6	42.53	15.91	103.71	400
35	14.162	623.2	0.995	184.9	344.3	42.98	15.13	84.64	419
36	15.153	756.9	0.988	199.8	370.4	43.40	14.78	72.95	433
37	16.138	887.7	0.983	214.5	396.1	43.80	14.51	64.88	447
38	17.119	1020.	0.980	228.7	421.4	44.18	14.21	58.97	461
39	18.096	1152.	0.976	242.8	446.5	44.55	14.02	54.39	474
40	19.070	1283.	0.973	256.7	471.4	44.90	13.87	50.81	486
42	21.006	1545.	0.968	284.2	520.7	45.57	13.65	45.51	509
44	22.938	1809.	0.964	311.4	569.6	46.20	13.53	41.80	530
46	24.864	2073.	0.961	338.4	618.3	46.80	13.46	39.11	550
48	26.784	2334.	0.959	365.3	666.8	47.37	13.44	37.08	569
50	28.702	2597.	0.957	392.2	715.3	47.92	13.45	35.49	587
55	33.479	3254.	0.953	459.6	836.6	49.21	13.57	32.78	628
60	38.238	3909.	0.950	528.5	958.9	50.41	13.76	31.10	666
65	42.990	4564.	0.948	598.0	1082.0	51.52	14.08	30.09	700
70	47.723	5217.	0.946	669.4	1206.7	52.58	14.53	29.55	730
75	52.435	5866.	0.944	743.5	1333.8	53.60	15.10	29.35	757
80	57.146	6515.	0.941	820.6	1464.0	54.60	15.78	29.39	781
85	61.852	7165.	0.939	901.4	1597.8	55.57	16.55	29.63	803
90	66.549	7810.	0.936	986.2	1735.4	56.54	17.37	30.00	823
95	71.218	8451.	0.933	1075.2	1877.0	57.51	18.23	30.47	843
100	75.872	9090.	0.930	1168.5	2022.7	58.46	19.09	30.99	861
0.0095 GMOLE/CM^3 ISOCHORE									
* 32.287	11.531	187.1	1.097	126.9	249.9	41.03	17.55	250.73	367
33	12.314	286.2	1.085	139.7	271.1	41.42	17.09	169.59	378
34	13.392	425.3	1.072	156.3	299.2	41.91	16.13	119.33	398
35	14.458	561.7	1.062	172.0	326.2	42.37	15.29	94.20	417
36	15.516	695.6	1.055	187.1	352.6	42.79	14.91	79.53	432
37	16.567	829.0	1.049	201.9	378.6	43.20	14.61	69.78	446
38	17.615	963.2	1.047	216.1	404.0	43.58	14.30	62.83	461
39	18.658	1097.	1.043	230.3	429.3	43.95	14.10	57.50	474
40	19.698	1230.	1.040	244.4	454.4	44.30	13.94	53.39	487
42	21.767	1498.	1.034	272.0	504.1	44.98	13.71	47.40	510
44	23.832	1767.	1.030	299.3	553.4	45.61	13.57	43.26	532
46	25.890	2035.	1.027	326.3	602.5	46.21	13.50	40.29	552
48	27.943	2303.	1.025	353.3	651.3	46.79	13.47	38.05	572
50	29.994	2572.	1.023	380.2	700.1	47.34	13.47	36.31	590
55	35.103	3244.	1.019	447.8	822.2	48.62	13.59	33.37	633
60	40.194	3916.	1.017	516.7	945.4	49.82	13.77	31.56	672
65	45.277	4586.	1.014	586.3	1069.3	50.94	14.09	30.47	706
70	50.341	5255.	1.012	657.9	1194.8	52.00	14.55	29.87	736
75	55.382	5920.	1.010	732.0	1322.7	53.02	15.12	29.62	763
80	60.421	6585.	1.007	809.3	1453.7	54.02	15.81	29.64	788
85	65.455	7250.	1.004	890.2	1588.3	55.00	16.58	29.85	810
90	70.479	7910.	1.001	975.2	1726.9	55.97	17.40	30.21	831
95	75.472	8568.	0.998	1064.3	1869.3	56.93	18.26	30.66	850
100	80.450	9227.	0.994	1157.8	2015.9	57.89	19.13	31.17	869

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0100 GMOLE/CM^3 ISOCHORE									
* 32.430	11.777	148.7	1.167	116.1	235.5	40.50	17.75	318.69	366
33	12.442	228.9	1.157	126.6	252.7	40.82	17.36	212.75	375
34	13.590	369.5	1.141	143.5	281.2	41.32	16.36	137.83	396
35	14.725	506.7	1.130	159.4	308.6	41.78	15.46	104.82	415
36	15.850	641.8	1.122	174.6	335.2	42.21	15.03	86.55	431
37	16.969	776.7	1.117	189.5	361.4	42.62	14.69	74.88	446
38	18.083	912.7	1.114	203.8	387.0	43.00	14.39	66.77	461
39	19.194	1049.	1.111	218.1	412.5	43.37	14.17	60.65	475
40	20.301	1184.	1.107	232.1	437.8	43.73	14.00	55.97	488
42	22.505	1457.	1.102	259.9	487.9	44.41	13.76	49.24	512
44	24.706	1731.	1.098	287.2	537.6	45.04	13.61	44.68	534
46	26.900	2004.	1.095	314.4	586.9	45.65	13.53	41.42	555
48	29.088	2279.	1.093	341.4	636.1	46.22	13.50	38.98	575
50	31.275	2554.	1.091	368.4	685.3	46.77	13.50	37.10	594
55	36.725	3242.	1.087	436.1	808.2	48.06	13.61	33.93	637
60	42.155	3930.	1.085	505.1	932.2	49.26	13.79	31.99	677
65	47.577	4616.	1.082	574.8	1056.9	50.38	14.11	30.82	712
70	52.980	5302.	1.080	646.4	1183.2	51.44	14.56	30.16	743
75	58.357	5983.	1.077	720.6	1311.9	52.46	15.14	29.88	770
80	63.733	6665.	1.074	798.0	1443.8	53.46	15.83	29.87	795
85	69.103	7345.	1.071	879.1	1579.3	54.45	16.60	30.06	817
90	74.461	8021.	1.068	964.2	1718.6	55.42	17.43	30.40	838
95	79.787	8695.	1.064	1053.5	1861.9	56.38	18.30	30.84	858
100	85.096	9366.	1.061	1147.2	2009.4	57.35	19.17	31.34	877
0.0105 GMOLE/CM^3 ISOCHORE									
* 32.553	11.991	115.7	1.239	105.2	220.9	39.99	17.97	414.68	366
33	12.544	179.0	1.229	113.7	234.7	40.24	17.66	273.50	373
34	13.762	320.5	1.211	130.8	263.6	40.76	16.59	159.60	394
35	14.966	458.0	1.198	146.9	291.3	41.22	15.63	116.45	414
36	16.159	594.2	1.190	162.3	318.2	41.66	15.14	93.94	430
37	17.345	730.6	1.185	177.2	344.6	42.07	14.75	80.09	446
38	18.528	868.4	1.183	191.6	370.4	42.45	14.46	70.73	462
39	19.708	1006.	1.179	205.9	396.1	42.82	14.24	63.77	476
40	20.883	1144.	1.176	220.1	421.6	43.18	14.06	58.50	489
42	23.225	1422.	1.171	247.9	472.0	43.86	13.80	51.03	514
44	25.564	1702.	1.167	275.3	522.0	44.50	13.65	46.03	537
46	27.896	1981.	1.164	302.5	571.7	45.10	13.56	42.50	559
48	30.223	2262.	1.162	329.6	621.3	45.68	13.52	39.86	579
50	32.549	2543.	1.160	356.7	670.8	46.23	13.52	37.85	598
55	38.347	3248.	1.157	424.5	794.5	47.52	13.62	34.45	643
60	44.125	3952.	1.154	493.5	919.3	48.72	13.80	32.39	683
65	49.895	4655.	1.152	563.3	1044.8	49.84	14.12	31.14	718
70	55.644	5357.	1.149	635.0	1171.9	50.90	14.58	30.44	750
75	61.366	6056.	1.146	709.3	1301.5	51.93	15.16	30.12	777
80	67.087	6754.	1.143	786.8	1434.2	52.93	15.85	30.08	802
85	72.801	7450.	1.140	868.0	1570.5	53.91	16.63	30.25	825
90	78.501	8142.	1.136	953.2	1710.8	54.89	17.47	30.58	846
95	84.169	8833.	1.132	1042.7	1854.9	55.85	18.33	31.01	867
100	89.817	9520.	1.128	1136.6	2003.3	56.82	19.21	31.50	886
0.0110 GMOLE/CM^3 ISOCHORE									
* 32.656	12.174	87.75	1.310	94.2	206.3	39.49	18.22	552.88	366
33	12.622	136.4	1.301	100.9	217.2	39.69	17.97	360.82	371
34	13.912	277.8	1.281	118.3	246.4	40.21	16.84	184.95	392
35	15.184	415.5	1.267	134.6	274.5	40.68	15.80	128.99	413
36	16.445	552.7	1.258	150.1	301.6	41.12	15.24	101.57	430
37	17.700	690.6	1.254	165.1	328.2	41.53	14.80	85.32	447
38	18.953	830.1	1.252	179.5	354.1	41.91	14.52	74.65	463
39	20.202	970.1	1.249	193.9	380.0	42.29	14.29	66.81	477
40	21.446	1111.	1.246	208.1	405.6	42.65	14.11	60.94	491
42	23.928	1394.	1.242	236.0	456.4	43.33	13.84	52.72	517
44	26.409	1679.	1.238	263.5	506.8	43.97	13.68	47.31	540
46	28.882	1964.	1.235	290.8	556.8	44.58	13.59	43.51	562
48	31.351	2252.	1.233	317.9	606.7	45.15	13.54	40.69	583
50	33.820	2539.	1.231	345.0	656.5	45.71	13.54	38.54	603
55	39.974	3261.	1.228	412.9	781.1	47.00	13.64	34.94	648
60	46.109	3983.	1.225	482.0	906.7	48.20	13.82	32.76	689
65	52.234	4703.	1.223	551.8	1033.0	49.32	14.14	31.44	725
70	58.339	5422.	1.220	623.6	1161.0	50.38	14.60	30.69	757
75	64.414	6138.	1.217	698.0	1291.4	51.41	15.18	30.34	785
80	70.488	6853.	1.214	775.6	1424.9	52.41	15.88	30.28	810
85	76.554	7565.	1.210	857.0	1562.1	53.40	16.66	30.43	833
90	82.605	8273.	1.206	942.3	1703.2	54.37	17.50	30.75	855
95	88.623	8983.	1.202	1032.0	1848.3	55.34	18.37	31.16	875
100	94.618	9686.	1.198	1126.0	1997.6	56.31	19.25	31.65	895

* TWO-PHASE BOUNDARY

TABLE X1. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_V, HEAT CAPACITY J/GMOLE-K	C_P, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0115 GMOLE/CM^3 ISOCHORE									
* 32.742	12.329	64.68	1.381	83.1	191.7	39.00	18.49	758.14	365
33	12.681	100.9	1.373	88.3	200.0	39.16	18.29	490.81	369
34	14.041	241.2	1.350	106.0	229.7	39.68	17.08	214.02	390
35	15.382	378.7	1.336	122.5	258.0	40.16	15.96	142.26	412
36	16.712	517.0	1.327	138.1	285.4	40.60	15.33	109.30	430
37	18.037	656.6	1.323	153.2	312.1	41.02	14.83	90.46	449
38	19.359	798.0	1.323	167.6	338.2	41.40	14.57	78.43	465
39	20.679	940.1	1.320	182.0	364.2	41.77	14.34	69.71	479
40	21.995	1083.	1.317	196.3	390.1	42.14	14.15	63.24	493
42	24.620	1373.	1.313	224.3	441.2	42.82	13.88	54.30	520
44	27.244	1663.	1.310	251.8	491.9	43.46	13.71	48.50	544
46	29.861	1955.	1.308	279.1	542.3	44.07	13.61	44.44	566
48	32.476	2249.	1.306	306.3	592.5	44.64	13.56	41.45	588
50	35.090	2543.	1.304	333.4	642.6	45.20	13.55	39.17	608
55	41.609	3283.	1.301	401.4	768.0	46.49	13.65	35.38	654
60	48.110	4022.	1.298	470.5	894.4	47.70	13.83	33.10	696
65	54.599	4760.	1.296	540.4	1021.5	48.82	14.15	31.72	732
70	61.068	5497.	1.293	612.3	1150.4	49.88	14.62	30.92	765
75	67.506	6231.	1.289	686.8	1281.6	50.91	15.20	30.54	793
80	73.941	6963.	1.286	764.5	1416.0	51.91	15.90	30.46	819
85	80.368	7691.	1.282	846.0	1554.1	52.90	16.68	30.60	842
90	86.777	8417.	1.278	931.5	1696.1	53.88	17.53	30.90	864
95	93.154	9144.	1.273	1021.3	1842.1	54.85	18.40	31.31	884
100	99.505	9865.	1.269	1115.5	1992.2	55.81	19.28	31.79	904
0.0120 GMOLE/CM^3 ISOCHORE									
* 32.811	12.454	45.91	1.451	71.9	177.0	38.52	18.78	1077.27	364
33	12.724	77.04	1.444	75.9	183.3	38.64	18.63	691.01	366
34	14.154	210.3	1.420	93.9	213.4	39.17	17.32	246.58	388
35	15.564	347.5	1.405	110.6	242.0	39.66	16.10	155.90	411
36	16.963	487.0	1.397	126.3	269.5	40.10	15.40	116.91	431
37	18.358	628.4	1.394	141.4	296.4	40.52	14.84	95.38	451
38	19.752	771.8	1.394	155.8	322.6	40.90	14.61	81.97	466
39	21.143	916.2	1.392	170.3	348.8	41.28	14.37	72.40	482
40	22.531	1062.	1.390	184.6	374.8	41.64	14.18	65.35	496
42	25.303	1358.	1.386	212.6	426.3	42.32	13.90	55.73	523
44	28.073	1654.	1.384	240.2	477.3	42.97	13.73	49.57	548
46	30.838	1952.	1.382	267.6	528.0	43.57	13.62	45.28	571
48	33.601	2254.	1.380	294.8	578.5	44.15	13.58	42.13	593
50	36.364	2555.	1.379	321.9	629.0	44.71	13.56	39.74	613
55	43.258	3312.	1.376	389.9	755.2	46.00	13.66	35.78	660
60	50.132	4070.	1.373	459.2	882.5	47.21	13.84	33.40	703
65	56.995	4826.	1.370	529.1	1010.4	48.33	14.17	31.96	740
70	63.838	5587.	1.367	601.1	1140.1	49.39	14.63	31.12	773
75	70.647	6335.	1.364	675.7	1272.2	50.42	15.22	30.71	801
80	77.453	7084.	1.360	753.5	1407.5	51.43	15.92	30.62	827
85	84.247	7829.	1.356	835.0	1546.4	52.42	16.71	30.75	851
90	91.023	8579.	1.351	920.7	1689.3	53.39	17.55	31.04	873
95	97.769	9318.	1.347	1010.7	1836.2	54.37	18.43	31.44	894
100	104.485	10056.	1.342	1105.0	1987.3	55.34	19.32	31.92	914
0.0125 GMOLE/CM^3 ISOCHORE									
* 32.866	12.555	31.18	1.518	60.7	162.5	38.05	19.07	1594.65	362
33	12.754	49.31	1.513	63.7	167.1	38.14	18.97	1012.79	364
34	14.252	184.7	1.488	82.0	197.5	38.68	17.55	281.98	386
35	15.731	321.7	1.474	98.8	226.4	39.17	16.21	169.49	411
36	17.200	462.6	1.468	114.7	254.1	39.62	15.45	124.15	432
37	18.666	606.1	1.466	129.8	281.1	40.03	14.84	99.92	453
38	20.132	751.6	1.467	144.2	307.4	40.42	14.64	85.19	469
39	21.596	898.6	1.465	158.7	333.8	40.79	14.40	74.82	484
40	23.058	1048.	1.464	173.0	359.9	41.16	14.20	67.23	499
42	25.979	1350.	1.461	201.1	411.7	41.84	13.92	57.00	527
44	28.900	1653.	1.459	228.8	463.0	42.49	13.74	50.51	553
46	31.815	1958.	1.458	256.1	514.0	43.09	13.64	46.02	576
48	34.731	2266.	1.457	283.3	564.9	43.67	13.59	42.73	598
50	37.646	2575.	1.455	310.5	615.7	44.23	13.57	40.25	619
55	44.923	3351.	1.453	378.5	742.7	45.52	13.67	36.13	667
60	52.181	4127.	1.450	447.8	870.8	46.73	13.85	33.67	710
65	59.427	4907.	1.447	517.9	999.6	47.85	14.18	32.18	748
70	66.652	5678.	1.443	589.9	1130.2	48.92	14.65	31.30	781
75	73.843	6450.	1.440	664.6	1263.1	49.95	15.24	30.87	810
80	81.027	7217.	1.435	742.5	1399.3	50.96	15.95	30.76	836
85	88.199	7979.	1.431	824.2	1539.1	51.95	16.73	30.88	860
90	95.351	8740.	1.426	910.0	1682.9	52.93	17.58	31.17	882
95	102.474	9504.	1.422	1000.1	1830.7	53.90	18.46	31.56	904
100	109.564	10260.	1.417	1094.6	1982.7	54.87	19.35	32.04	924

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE	PRESSURE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE	INTERNAL ENERGY	ENTHALPY	ENTROPY	C_v, HEAT CAPACITY	C_p, HEAT CAPACITY	VELOCITY OF SOUND
DEG. KELVIN	ATM	CM^3ATM/GMOLE	ATM/K	J/GMOLE	J/GMOLE	J/GMOLE-K	J/GMOLE-K	J/GMOLE-K	METER/SEC
0.0130 GMOLE/CM^3 ISOCHORE									
* 32.908	12.633	19.89	1.583	49.5	148.0	37.59	19.34	2504.38	360
33	12.775	32.02	1.580	51.8	151.4	37.66	19.28	1560.85	361
34	14.339	163.9	1.556	70.3	182.1	38.21	17.75	318.81	385
35	15.886	301.0	1.544	87.3	211.1	38.70	16.29	182.41	412
36	17.427	443.6	1.539	103.2	239.0	39.15	15.49	130.77	434
37	18.965	589.4	1.539	118.3	266.2	39.57	14.83	103.95	456
38	20.504	737.5	1.540	132.7	292.5	39.95	14.66	87.97	472
39	22.042	887.2	1.540	147.2	319.1	40.33	14.41	76.89	488
40	23.580	1040.	1.539	161.6	345.3	40.69	14.22	68.84	503
42	26.654	1349.	1.538	189.7	397.4	41.38	13.93	58.07	532
44	29.727	1658.	1.537	217.3	449.0	42.02	13.75	51.31	558
46	32.797	1971.	1.536	244.7	500.4	42.63	13.65	46.65	582
48	35.869	2287.	1.535	272.0	551.5	43.21	13.59	43.24	605
50	38.940	2603.	1.534	299.1	602.7	43.76	13.58	40.68	626
55	46.610	3399.	1.531	367.2	730.5	45.06	13.68	36.43	674
60	54.261	4194.	1.528	436.6	859.5	46.27	13.87	33.90	718
65	61.900	4990.	1.525	506.7	989.1	47.39	14.19	32.36	756
70	69.517	5784.	1.521	578.8	1120.6	48.46	14.66	31.46	790
75	77.099	6576.	1.517	653.5	1254.5	49.49	15.26	31.01	819
80	84.671	7362.	1.513	731.6	1391.5	50.50	15.97	30.88	846
85	92.229	8142.	1.508	813.4	1532.2	51.49	16.76	31.00	870
90	99.766	8921.	1.504	899.3	1676.9	52.47	17.61	31.28	892
95	107.276	9704.	1.498	989.5	1825.7	53.44	18.49	31.67	914
100	114.748	10478.	1.493	1084.2	1978.6	54.42	19.38	32.14	934
0.0135 GMOLE/CM^3 ISOCHORE									
* 32.938	12.688	11.48	1.644	38.5	133.7	37.14	19.57	4332.45	357
33	12.787	19.43	1.642	40.1	136.1	37.19	19.54	2566.29	358
34	14.417	147.7	1.623	58.9	167.1	37.75	17.91	354.86	384
35	16.033	285.3	1.614	76.0	196.3	38.25	16.34	193.96	413
36	17.645	430.0	1.612	91.9	224.3	38.70	15.50	136.43	436
37	19.256	578.6	1.613	107.0	251.6	39.11	14.81	107.30	459
38	20.871	729.5	1.615	121.4	278.0	39.49	14.66	90.24	475
39	22.485	887.3	1.616	135.9	304.7	39.87	14.42	78.55	492
40	24.099	1038.	1.616	150.2	331.1	40.23	14.22	70.13	507
42	27.329	1355.	1.616	178.4	383.5	40.92	13.93	58.93	537
44	30.559	1677.	1.616	206.0	435.4	41.56	13.75	51.95	563
46	33.787	1997.	1.615	233.4	487.0	42.17	13.65	47.16	588
48	37.019	2316.	1.615	260.7	538.5	42.75	13.60	43.65	611
50	40.251	2640.	1.614	287.9	590.0	43.31	13.59	41.03	633
55	48.324	3456.	1.612	356.0	718.7	44.61	13.69	36.68	682
60	56.377	4277.	1.609	425.4	848.5	45.81	13.88	34.10	726
65	64.419	5088.	1.606	495.5	979.0	46.94	14.21	32.52	765
70	72.438	5907.	1.602	567.7	1111.4	48.01	14.68	31.59	799
75	80.421	6714.	1.597	642.6	1246.2	49.04	15.28	31.12	829
80	88.391	7519.	1.592	720.7	1384.1	50.05	15.99	30.99	856
85	96.343	8318.	1.588	802.6	1525.7	51.04	16.78	31.10	880
90	104.275	9117.	1.582	888.6	1671.3	52.02	17.64	31.38	903
95	112.181	9919.	1.577	979.0	1821.0	53.00	18.52	31.77	925
100	120.044	10711.	1.572	1073.9	1974.9	53.97	19.42	32.24	945
0.0140 GMOLE/CM^3 ISOCHORE									
* 32.958	12.726	5.523	1.703	27.5	119.6	36.71	19.74	8968.32	355
33	12.795	10.78	1.702	28.8	121.4	36.74	19.73	4606.63	356
34	14.488	135.9	1.689	47.6	152.5	37.31	18.01	387.00	383
35	16.172	274.7	1.685	64.8	181.9	37.81	16.35	203.35	414
36	17.858	421.9	1.686	80.7	210.0	38.25	15.50	140.88	439
37	19.544	573.6	1.689	95.9	237.3	38.67	14.78	109.86	463
38	21.235	727.7	1.692	110.2	263.9	39.05	14.66	91.90	479
39	22.926	884.1	1.693	124.7	290.6	39.43	14.41	79.77	496
40	24.619	1044.	1.694	139.0	317.2	39.79	14.21	71.07	512
42	28.010	1368.	1.696	167.1	369.9	40.48	13.93	59.57	542
44	31.400	1693.	1.697	194.8	422.1	41.12	13.75	52.43	570
46	34.790	2021.	1.697	222.2	474.0	41.73	13.65	47.54	595
48	38.186	2354.	1.697	249.5	525.8	42.31	13.60	43.97	618
50	41.582	2687.	1.697	276.6	577.6	42.86	13.59	41.30	641
55	50.068	3523.	1.695	344.8	707.2	44.16	13.70	36.88	691
60	58.535	4360.	1.692	414.2	837.9	45.37	13.89	34.25	735
65	66.989	5198.	1.688	484.5	969.3	46.50	14.22	32.64	774
70	75.421	6033.	1.684	556.7	1102.6	47.57	14.70	31.70	809
75	83.815	6866.	1.679	631.7	1238.3	48.60	15.30	31.22	839
80	92.193	7699.	1.674	709.9	1377.1	49.61	16.01	31.08	866
85	100.549	8528.	1.669	791.9	1519.6	50.60	16.81	31.19	891
90	108.885	9326.	1.663	878.1	1666.1	51.59	17.66	31.46	914
95	117.196	10147.	1.658	968.6	1816.8	52.57	18.55	31.85	936
100	125.461	10958.	1.652	1063.6	1971.6	53.54	19.45	32.32	957

* TWO-PHASE BOUNDARY

TABLE X1. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0145 GMOLE/CM ISOCHORE									
* 32.970	12.748	1.655	1.759	16.7	105.8	36.28	19.82		353
33	12.799	5.341	1.758	17.7	107.2	36.31	19.84	9225.50	353
34	14.554	128.2	1.755	36.7	138.4	36.88	18.05	411.55	383
35	16.308	269.0	1.757	53.8	167.8	37.38	16.33	209.88	417
36	18.068	419.3	1.761	69.7	196.0	37.82	15.47	143.85	443
37	19.831	574.7	1.766	84.8	223.4	38.24	14.74	111.51	467
38	21.600	732.4	1.769	99.1	250.1	38.62	14.63	92.92	483
39	23.370	892.7	1.772	113.6	276.9	39.00	14.39	80.51	501
40	25.144	1056.	1.774	127.9	303.6	39.36	14.20	71.65	518
42	28.699	1389.	1.778	156.0	356.6	40.04	13.92	59.98	548
44	32.254	1723.	1.780	183.7	409.1	40.69	13.75	52.74	576
46	35.810	2060.	1.781	211.1	461.3	41.30	13.65	47.80	602
48	39.374	2401.	1.782	238.3	513.4	41.87	13.60	44.19	626
50	42.939	2743.	1.782	265.5	565.5	42.43	13.59	41.49	649
55	51.849	3601.	1.780	333.7	696.0	43.73	13.70	37.03	699
60	60.739	4460.	1.777	403.2	827.6	44.94	13.90	34.37	744
65	69.618	5319.	1.772	473.4	959.9	46.06	14.24	32.74	784
70	78.473	6176.	1.768	545.8	1094.1	47.14	14.71	31.78	819
75	87.288	7029.	1.763	620.8	1230.8	48.17	15.32	31.29	850
80	96.083	7874.	1.757	699.1	1370.6	49.18	16.03	31.15	877
85	104.854	8713.	1.752	781.3	1514.0	50.18	16.83	31.26	902
90	113.604	9551.	1.746	867.5	1661.4	51.16	17.69	31.53	925
95	122.330	10390.	1.740	958.2	1813.0	52.14	18.58	31.92	947
100	131.005	11229.	1.735	1053.3	1968.8	53.12	19.47	32.40	969
0.0150 GMOLE/CM^3 ISOCHORE									
* 32.975	12.757	0.512	1.812	6.0	92.2	35.87	19.81		352
33	12.800	2.543	1.812	7.0	93.4	35.90	19.83	19210.94	352
34	14.617	124.8	1.821	25.9	124.6	36.46	18.02	424.99	385
35	16.442	268.5	1.831	43.0	154.1	36.96	16.27	212.97	420
36	18.278	422.5	1.839	58.9	182.3	37.40	15.43	145.17	447
37	20.120	583.0	1.845	73.9	209.8	37.82	14.69	112.17	473
38	21.968	744.0	1.849	88.2	236.6	38.20	14.60	93.25	489
39	23.820	908.6	1.853	102.7	263.6	38.57	14.36	80.75	507
40	25.677	1076.	1.857	116.9	290.4	38.94	14.17	71.87	524
42	29.400	1418.	1.862	145.0	343.6	39.62	13.90	60.15	555
44	33.124	1761.	1.865	172.6	396.4	40.26	13.74	52.88	584
46	36.851	2108.	1.868	200.0	448.9	40.87	13.64	47.92	610
48	40.589	2458.	1.869	227.2	501.4	41.45	13.60	44.31	634
50	44.327	2809.	1.869	254.4	553.8	42.00	13.60	41.60	657
55	53.671	3698.	1.867	322.6	685.2	43.30	13.71	37.12	709
60	62.996	4571.	1.864	392.1	817.7	44.52	13.91	34.44	754
65	72.311	5454.	1.859	462.5	950.9	45.64	14.25	32.80	794
70	81.599	6332.	1.854	534.9	1086.1	46.71	14.73	31.84	829
75	90.847	7207.	1.848	610.0	1223.7	47.75	15.34	31.35	860
80	100.069	8073.	1.842	688.5	1364.4	48.76	16.05	31.20	888
85	109.265	8937.	1.837	770.7	1508.8	49.76	16.85	31.31	913
90	118.439	9792.	1.831	857.1	1657.1	50.75	17.71	31.58	937
95	127.589	10650.	1.825	947.9	1809.7	51.73	18.60	31.98	959
100	136.685	11500.	1.819	1043.1	1966.4	52.71	19.50	32.46	981
0.0155 GMOLE/CM^3 ISOCHORE									
* 32.976	12.759	0.962	1.864	-4.4	79.0	35.47	19.69		351
33	12.801	2.005	1.865	-3.4	80.2	35.50	19.71	24160.64	351
34	14.679	125.6	1.888	15.4	111.3	36.06	17.91	424.85	387
35	16.578	273.4	1.906	32.4	140.8	36.55	16.17	212.31	425
36	18.491	431.8	1.918	48.2	169.0	37.00	15.37	144.76	452
37	20.414	595.9	1.927	63.2	196.6	37.41	14.64	111.85	478
38	22.345	767.7	1.931	77.4	223.4	37.79	14.56	92.90	495
39	24.280	937.1	1.937	91.8	250.5	38.16	14.33	80.50	513
40	26.222	1104.	1.941	106.0	277.5	38.52	14.14	71.70	531
42	30.118	1455.	1.948	134.0	330.9	39.20	13.88	60.08	563
44	34.017	1809.	1.953	161.6	384.0	39.85	13.72	52.85	592
46	37.919	2168.	1.956	189.0	436.8	40.45	13.63	47.92	619
48	41.834	2525.	1.958	216.2	489.7	41.03	13.59	44.33	643
50	45.750	2886.	1.959	243.4	542.4	41.59	13.59	41.63	666
55	55.541	3791.	1.957	311.6	674.7	42.89	13.72	37.16	718
60	65.313	4695.	1.953	381.2	808.1	44.10	13.92	34.48	765
65	75.074	5601.	1.948	451.6	942.3	45.23	14.27	32.84	805
70	84.807	6507.	1.942	524.1	1078.5	46.30	14.75	31.88	840
75	94.498	7408.	1.936	599.3	1217.0	47.34	15.36	31.38	872
80	104.158	8287.	1.930	677.8	1358.7	48.35	16.07	31.24	900
85	113.789	9168.	1.924	760.2	1504.0	49.35	16.87	31.35	925
90	123.398	10049.	1.918	846.7	1653.3	50.34	17.73	31.62	949
95	132.982	10925.	1.912	937.6	1806.9	51.32	18.63	32.03	972
100	142.508	11796.	1.906	1033.0	1964.6	52.30	19.53	32.51	994

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0160 GMOLE/CM^3 ISOCHORE									
* 32.975	12.757	0.433	1.916	-13.6	67.2	35.11	19.68		350
33	12.803	3.620	1.918	-13.1	68.0	35.12	19.63	13288.98	351
34	14.743	131.1	1.957	5.6	99.0	35.68	17.75	410.92	390
35	16.717	284.1	1.984	22.4	128.2	36.17	15.79	207.68	433
36	18.711	447.6	2.000	37.8	156.3	36.60	15.10	142.46	461
37	20.717	616.9	2.011	52.7	183.9	37.01	14.57	110.54	485
38	22.732	789.0	2.015	66.6	210.6	37.38	14.44	91.84	502
39	24.753	963.8	2.022	81.0	237.7	37.75	14.26	79.76	520
40	26.783	1141.	2.028	95.2	264.8	38.11	14.11	71.19	538
42	30.857	1507.	2.037	123.1	318.5	38.79	13.87	59.81	571
44	34.935	1867.	2.044	150.7	371.9	39.44	13.71	52.67	600
46	39.018	2233.	2.048	178.0	425.1	40.04	13.62	47.80	628
48	43.116	2603.	2.050	205.2	478.3	40.62	13.59	44.25	653
50	47.214	2974.	2.051	232.4	531.4	41.18	13.59	41.58	676
55	57.464	3904.	2.049	300.6	664.5	42.48	13.72	37.15	729
60	67.694	4833.	2.045	370.3	798.9	43.69	13.93	34.49	775
65	77.914	5763.	2.039	440.7	934.2	44.82	14.28	32.85	816
70	88.104	6687.	2.033	513.3	1071.3	45.89	14.77	31.89	852
75	98.249	7607.	2.026	588.6	1210.8	46.93	15.38	31.40	884
80	108.358	8516.	2.020	667.3	1353.5	47.95	16.10	31.26	912
85	118.435	9420.	2.013	749.7	1499.8	48.95	16.90	31.37	938
90	128.491	10323.	2.006	836.3	1650.0	49.94	17.76	31.65	962
95	138.517	11218.	2.000	927.4	1804.6	50.92	18.65	32.06	985
100	148.484	12110.	1.994	1022.9	1963.2	51.90	19.55	32.55	1007
0.0165 GMOLE/CM^3 ISOCHORE									
* 32.972	12.752	3.858	1.970	-23.5	54.8	34.73	19.33	12368.44	352
33	12.806	7.611	1.972	-22.9	55.7	34.75	19.28	6297.36	353
34	14.811	141.7	2.029	-4.6	86.4	35.30	17.50	385.09	396
35	16.863	301.1	2.064	12.0	115.6	35.78	15.63	200.00	440
36	18.940	470.4	2.085	27.3	143.6	36.21	15.00	138.80	468
37	21.032	645.6	2.098	42.1	171.2	36.61	14.50	108.34	492
38	23.135	823.6	2.102	56.0	198.1	36.99	14.37	90.24	510
39	25.245	1004.	2.111	70.3	225.3	37.36	14.21	78.60	528
40	27.364	1187.	2.118	84.4	252.5	37.71	14.06	70.34	546
42	31.622	1559.	2.129	112.3	306.5	38.39	13.83	59.29	579
44	35.885	1935.	2.137	139.8	360.2	39.03	13.68	52.32	610
46	40.154	2312.	2.141	167.1	413.7	39.64	13.60	47.55	637
48	44.439	2693.	2.144	194.3	467.2	40.22	13.58	44.08	663
50	48.726	3074.	2.145	221.5	520.7	40.78	13.59	41.45	686
55	59.446	4030.	2.144	289.7	654.8	42.08	13.73	37.08	740
60	70.148	4984.	2.139	359.4	790.2	43.29	13.95	34.46	787
65	80.839	5939.	2.133	430.0	926.4	44.42	14.30	32.83	828
70	91.496	6886.	2.126	502.6	1064.5	45.50	14.79	31.88	864
75	102.107	7830.	2.119	578.0	1205.1	46.54	15.40	31.40	896
80	112.677	8762.	2.111	656.8	1348.7	47.55	16.12	31.27	924
85	123.212	9689.	2.104	739.3	1496.0	48.55	16.92	31.38	950
90	133.725	10615.	2.097	826.1	1647.3	49.54	17.78	31.66	975
95	144.203	11529.	2.091	917.2	1802.7	50.53	18.67	32.08	998
100	154.621	12441.	2.085	1012.8	1962.3	51.51	19.57	32.57	1020
0.0170 GMOLE/CM^3 ISOCHORE									
* 32.963	12.735	0.263	2.028	-33.3	42.6	34.36	18.89	5151.35	356
33	12.811	14.57	2.032	-32.6	43.8	34.39	18.83	3297.29	358
34	14.886	158.0	2.104	-14.6	74.2	34.92	17.18	351.12	403
35	17.019	325.1	2.148	1.8	103.2	35.40	15.46	189.65	448
36	19.182	501.0	2.173	16.9	131.3	35.82	14.89	133.80	476
37	21.364	682.7	2.187	31.6	158.9	36.23	14.43	105.35	501
38	23.557	867.2	2.192	45.5	185.9	36.60	14.30	88.13	518
39	25.759	1054.	2.202	59.7	213.3	36.97	14.15	77.06	537
40	27.971	1242.	2.211	73.8	240.5	37.32	14.01	69.18	555
42	32.418	1626.	2.224	101.6	294.8	38.00	13.80	58.58	589
44	36.872	2014.	2.232	129.0	348.8	38.64	13.66	51.82	620
46	41.333	2403.	2.238	156.3	402.7	39.25	13.59	47.19	648
48	45.811	2795.	2.241	183.5	456.5	39.83	13.57	43.81	673
50	50.291	3188.	2.243	210.6	510.4	40.38	13.59	41.25	697
55	61.495	4169.	2.241	278.9	645.4	41.68	13.74	36.97	751
60	72.680	5150.	2.236	348.6	781.8	42.90	13.96	34.39	798
65	83.855	6130.	2.229	419.2	919.0	44.03	14.32	32.79	840
70	94.993	7102.	2.221	492.0	1058.2	45.10	14.81	31.86	876
75	106.081	8069.	2.213	567.5	1199.8	46.15	15.42	31.38	909
80	117.123	9024.	2.206	646.3	1344.4	47.16	16.14	31.26	937
85	128.127	9976.	2.198	729.0	1492.7	48.17	16.94	31.37	964
90	139.109	10925.	2.191	815.9	1645.0	49.16	17.80	31.66	988
95	150.050	11859.	2.184	907.1	1801.4	50.14	18.70	32.09	1011
100	160.929	12792.	2.177	1002.8	1962.0	51.13	19.60	32.59	1034

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0175 GMOLE/CM^3 ISOCHORE									
* 32.947	12.705	17.23	2.091	-43.0	30.6	34.00	18.37	2783.62	362
33	12.821	25.48	2.097	-42.0	32.3	34.03	18.29	1903.33	365
34	14.970	181.0	2.184	-24.4	62.3	34.56	16.81	313.26	412
35	17.189	356.9	2.236	-8.4	91.1	35.02	15.26	177.48	457
36	19.442	540.2	2.264	6.6	119.2	35.45	14.78	127.76	485
37	21.717	728.9	2.281	21.2	146.9	35.85	14.35	101.71	510
38	24.004	920.5	2.286	35.1	174.1	36.22	14.23	85.58	527
39	26.301	1114.	2.297	49.2	201.5	36.58	14.08	75.18	547
40	28.608	1309.	2.307	63.2	228.9	36.94	13.95	67.76	565
42	33.250	1704.	2.321	90.9	283.4	37.61	13.76	57.69	599
44	37.902	2106.	2.331	118.3	337.8	38.25	13.63	51.20	630
46	42.560	2507.	2.337	145.5	391.9	38.86	13.57	46.73	659
48	47.237	2910.	2.341	172.7	446.2	39.44	13.56	43.47	685
50	51.916	3314.	2.343	199.8	500.4	39.99	13.58	40.98	709
55	63.618	4324.	2.341	268.1	636.4	41.29	13.74	36.82	763
60	75.300	5331.	2.336	337.8	773.8	42.51	13.97	34.29	811
65	86.971	6337.	2.328	408.6	912.1	43.64	14.33	32.72	853
70	98.601	7335.	2.319	481.4	1052.3	44.72	14.82	31.81	889
75	110.179	8325.	2.311	557.0	1195.0	45.76	15.44	31.35	922
80	121.704	9305.	2.302	636.0	1340.6	46.78	16.16	31.23	951
85	133.191	10281.	2.294	718.8	1489.9	47.78	16.96	31.36	977
90	144.653	11254.	2.286	805.7	1643.2	48.78	17.82	31.65	1002
95	156.065	12207.	2.279	897.1	1800.7	49.76	18.72	32.09	1026
100	167.417	13167.	2.272	992.9	1962.2	50.75	19.62	32.59	1048
0.0180 GMOLE/CM^3 ISOCHORE									
* 32.922	12.659	28.43	2.160	-52.7	18.6	33.65	17.80	1708.25	370
33	12.837	41.69	2.171	-51.2	21.0	33.69	17.70	1184.69	374
34	15.068	211.8	2.270	-34.2	50.6	34.20	16.41	275.15	422
35	17.377	397.5	2.328	-18.5	79.4	34.66	15.06	164.29	467
36	19.724	588.9	2.359	-3.6	107.4	35.08	14.65	121.00	494
37	22.095	785.3	2.378	10.9	135.2	35.47	14.27	97.57	520
38	24.480	984.4	2.383	24.7	162.5	35.84	14.15	82.68	538
39	26.875	1185.	2.395	38.8	190.1	36.21	14.01	73.05	557
40	29.282	1387.	2.406	52.7	217.6	36.56	13.89	66.12	576
42	34.124	1795.	2.422	80.3	272.4	37.23	13.71	56.63	610
44	38.980	2210.	2.433	107.6	327.1	37.87	13.60	50.45	642
46	43.842	2624.	2.440	134.8	381.6	38.47	13.55	46.18	670
48	48.723	3039.	2.444	161.9	436.2	39.05	13.55	43.05	697
50	53.607	3455.	2.446	189.0	490.8	39.60	13.58	40.65	721
55	65.822	4493.	2.444	257.3	627.8	40.91	13.75	36.62	775
60	78.014	5529.	2.438	327.1	766.3	42.12	13.99	34.16	824
65	90.195	6561.	2.429	397.9	905.7	43.26	14.35	32.63	866
70	102.330	7584.	2.420	470.9	1046.9	44.34	14.85	31.75	903
75	114.409	8599.	2.410	546.6	1190.6	45.38	15.46	31.31	935
80	126.431	9604.	2.401	625.7	1337.4	46.40	16.18	31.20	965
85	138.412	10604.	2.392	708.6	1487.7	47.41	16.99	31.33	992
90	150.366	11603.	2.384	795.6	1642.1	48.40	17.85	31.63	1017
95	162.260	12576.	2.376	887.1	1800.5	49.39	18.74	32.07	1040
100	174.094	13553.	2.368	983.1	1963.1	50.37	19.64	32.58	1063
0.0185 GMOLE/CM^3 ISOCHORE									
* 32.886	12.592	43.67	2.238	-62.4	6.6	33.29	17.20	1133.41	380
33	12.864	64.94	2.255	-60.4	10.1	33.35	17.08	782.12	387
34	15.183	251.5	2.362	-43.9	39.3	33.85	15.98	239.38	435
35	17.588	448.0	2.425	-28.4	67.9	34.30	14.85	150.84	478
36	20.033	648.3	2.458	-13.8	96.0	34.71	14.51	113.82	506
37	22.504	852.8	2.479	0.6	123.8	35.10	14.18	93.09	530
38	24.990	1060.	2.484	14.4	151.3	35.47	14.06	79.54	549
39	27.488	1269.	2.498	28.4	179.0	35.83	13.94	70.70	569
40	29.997	1477.	2.509	42.3	206.6	36.19	13.83	64.30	587
42	35.047	1900.	2.526	69.8	261.7	36.86	13.67	55.44	622
44	40.114	2328.	2.538	97.0	316.7	37.49	13.57	49.61	654
46	45.186	2755.	2.545	124.1	371.6	38.10	13.53	45.55	683
48	50.278	3187.	2.549	151.2	426.6	38.67	13.54	42.56	709
50	55.373	3621.	2.551	178.3	481.6	39.22	13.58	40.26	734
55	68.114	4688.	2.550	246.6	619.7	40.53	13.76	36.38	789
60	80.831	5743.	2.543	316.5	759.2	41.74	14.00	34.00	837
65	93.535	6803.	2.533	387.4	899.7	42.88	14.37	32.52	880
70	106.189	7857.	2.523	460.4	1042.0	43.96	14.87	31.66	917
75	118.781	8897.	2.513	536.3	1186.8	45.01	15.48	31.25	950
80	131.311	9922.	2.502	615.4	1334.6	46.03	16.21	31.15	979
85	143.800	10950.	2.493	698.5	1486.1	47.03	17.01	31.29	1006
90	156.259	11972.	2.484	785.6	1641.5	48.03	17.87	31.60	1031
95	168.645	12966.	2.475	877.2	1800.9	49.02	18.76	32.05	1055
100	180.973	13965.	2.467	973.3	1964.5	50.01	19.66	32.56	1078

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0190 GMOLE/CM^3 ISOCHORE									
* 32.840	12.507	64.55	2.325	-72.2	-5.5	32.94	16.59	788.18	393
33	12.904	97.25	2.350	-69.5	-0.7	33.02	16.45	542.44	402
34	15.321	301.6	2.462	-53.5	28.2	33.50	15.56	207.33	449
35	17.827	509.7	2.527	-38.4	56.7	33.94	14.65	137.68	491
36	20.375	719.5	2.561	-23.9	84.8	34.35	14.37	106.50	518
37	22.950	932.7	2.584	-9.6	112.7	34.74	14.09	88.41	542
38	25.542	1148.	2.589	4.2	140.4	35.11	13.98	76.25	561
39	28.146	1365.	2.604	18.1	168.2	35.47	13.87	68.22	581
40	30.761	1581.	2.616	31.9	195.9	35.82	13.77	62.35	600
42	36.026	2018.	2.634	59.3	251.4	36.49	13.63	54.15	635
44	41.310	2461.	2.646	86.4	306.8	37.12	13.54	48.68	667
46	46.600	2902.	2.654	113.5	362.0	37.72	13.51	44.84	696
48	51.909	3342.	2.658	140.6	417.4	38.30	13.53	42.01	722
50	57.221	3784.	2.660	167.7	472.8	38.85	13.57	39.82	747
55	70.504	4883.	2.658	236.0	612.0	40.15	13.77	36.10	802
60	83.760	5976.	2.650	305.9	752.6	41.37	14.02	33.81	851
65	97.001	7063.	2.640	376.9	894.2	42.51	14.39	32.39	894
70	110.186	8140.	2.629	450.0	1037.6	43.59	14.89	31.57	931
75	123.305	9205.	2.617	526.0	1183.6	44.64	15.51	31.18	964
80	136.356	10261.	2.606	605.3	1332.5	45.66	16.23	31.10	994
85	149.366	11315.	2.596	688.4	1485.0	46.67	17.03	31.24	1021
90	162.341	12361.	2.586	775.7	1641.5	47.67	17.90	31.56	1047
95	175.230	13377.	2.576	867.4	1801.9	48.66	18.79	32.02	1070
100	188.063	14398.	2.567	963.6	1966.5	49.64	19.69	32.54	1094
0.0195 GMOLE/CM^3 ISOCHORE									
* 32.780	12.398	91.90	2.422	-82.1	-17.7	32.59	15.99	573.42	407
33	12.963	148.9	2.457	-78.6	-11.2	32.69	15.84	392.45	419
34	15.487	363.7	2.569	-63.1	17.4	33.16	15.15	179.51	465
35	18.100	584.0	2.634	-48.3	45.8	33.59	14.45	125.24	504
36	20.755	803.9	2.669	-33.9	73.9	33.99	14.23	99.26	531
37	23.439	1026.	2.693	-19.8	102.0	34.38	14.00	83.67	555
38	26.141	1251.	2.699	-6.0	129.8	34.74	13.90	72.87	574
39	28.856	1476.	2.714	7.8	157.7	35.10	13.80	65.65	594
40	31.581	1701.	2.727	21.6	185.7	35.45	13.71	60.31	613
42	37.068	2153.	2.745	48.8	241.4	36.12	13.58	52.77	648
44	42.577	2610.	2.758	75.9	297.2	36.75	13.51	47.69	680
46	48.091	3065.	2.766	102.9	352.8	37.35	13.49	44.08	709
48	53.623	3519.	2.770	130.0	408.6	37.92	13.52	41.41	736
50	59.160	3973.	2.772	157.0	464.4	38.48	13.57	39.34	761
55	73.000	5104.	2.769	225.4	604.7	39.78	13.78	35.80	816
60	86.810	6227.	2.761	295.4	746.5	41.00	14.03	33.60	866
65	100.602	7343.	2.749	366.5	889.2	42.14	14.41	32.24	909
70	114.332	8447.	2.737	439.7	1033.8	43.22	14.91	31.46	946
75	127.989	9538.	2.725	515.8	1180.8	44.27	15.53	31.09	980
80	141.575	10620.	2.713	595.2	1330.8	45.30	16.25	31.03	1009
85	155.119	11701.	2.701	678.5	1484.5	46.31	17.06	31.18	1037
90	168.624	12772.	2.690	765.9	1642.1	47.31	17.92	31.51	1062
95	182.026	13811.	2.680	857.7	1803.5	48.30	18.81	31.98	1086
100	195.375	14855.	2.670	954.0	1969.2	49.29	19.71	32.50	1109
0.0200 GMOLE/CM^3 ISOCHORE									
* 32.707	12.266	127.7	2.530	-92.2	-30.0	32.23	15.41	430.67	424
33	13.047	198.4	2.575	-87.6	-21.5	32.37	15.26	294.63	439
34	15.687	439.6	2.683	-72.6	6.8	32.82	14.76	155.82	483
35	18.414	672.5	2.747	-58.1	35.2	33.24	14.26	113.73	519
36	21.181	903.0	2.782	-44.0	63.4	33.64	14.09	92.28	545
37	23.978	1135.	2.807	-29.9	91.5	34.02	13.91	78.98	569
38	26.795	1369.	2.814	-16.2	119.5	34.39	13.82	69.49	588
39	29.625	1603.	2.829	-2.4	147.6	34.74	13.73	63.05	608
40	32.464	1836.	2.842	11.2	175.7	35.09	13.65	58.22	627
42	38.182	2304.	2.861	38.4	231.9	35.75	13.54	51.34	663
44	43.923	2776.	2.873	65.5	288.0	36.38	13.48	46.64	695
46	49.668	3246.	2.881	92.4	344.1	36.98	13.48	43.28	724
48	55.431	3714.	2.885	119.4	400.2	37.56	13.51	40.77	750
50	61.197	4181.	2.887	146.5	456.5	38.11	13.57	38.82	775
55	75.612	5345.	2.884	214.8	597.9	39.41	13.79	35.46	831
60	89.991	6499.	2.874	284.9	740.8	40.63	14.05	33.37	881
65	104.348	7643.	2.862	356.1	884.7	41.77	14.43	32.07	924
70	118.637	8775.	2.849	429.4	1030.5	42.86	14.93	31.33	962
75	132.846	9892.	2.835	505.6	1178.7	43.91	15.56	30.99	995
80	146.980	11002.	2.822	585.2	1329.8	44.94	16.28	30.95	1025
85	161.071	12110.	2.809	668.6	1484.6	45.95	17.08	31.12	1053
90	175.117	13205.	2.797	756.1	1643.3	46.95	17.95	31.46	1079
95	189.045	14268.	2.786	848.1	1805.8	47.94	18.84	31.93	1102
100	202.921	15335.	2.775	944.5	1972.6	48.93	19.74	32.46	1126

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0205 GMOLE/CM^3 ISOCHORE									
* 32.620	12.110	173.9	2.651	-102.4	-42.6	31.87	14.88	332.64	442
33	13.164	272.3	2.705	-96.8	-31.7	32.04	14.75	228.49	460
34	15.929	531.2	2.806	-82.2	-3.5	32.48	14.41	135.88	502
35	18.775	776.8	2.866	-68.0	24.8	32.89	14.09	103.29	535
36	21.661	1018.	2.901	-53.9	53.1	33.28	13.96	85.67	561
37	24.577	1261.	2.926	-40.1	81.4	33.67	13.82	74.42	584
38	27.513	1504.	2.933	-26.3	109.6	34.03	13.74	66.16	603
39	30.462	1747.	2.949	-12.6	137.9	34.39	13.66	60.45	623
40	33.420	1989.	2.961	1.0	166.2	34.73	13.60	56.11	642
42	39.375	2473.	2.980	28.1	222.7	35.39	13.50	49.86	678
44	45.356	2960.	2.993	55.0	279.2	36.02	13.46	45.56	710
46	51.340	3445.	3.000	82.0	335.7	36.62	13.46	42.43	739
48	57.340	3927.	3.004	108.9	392.3	37.19	13.50	40.10	766
50	63.344	4409.	3.005	136.0	449.1	37.75	13.57	38.26	791
55	78.349	5606.	3.001	204.4	591.6	39.05	13.80	35.10	847
60	93.313	6792.	2.991	274.5	735.7	40.27	14.07	33.12	896
65	108.249	7965.	2.977	345.8	880.8	41.41	14.45	31.89	940
70	123.111	9126.	2.963	419.3	1027.7	42.50	14.96	31.19	978
75	137.885	10269.	2.948	495.6	1177.1	43.55	15.58	30.89	1011
80	152.581	11406.	2.934	575.2	1329.4	44.58	16.31	30.86	1042
85	167.232	12541.	2.920	658.8	1485.3	45.59	17.11	31.05	1069
90	181.832	13661.	2.907	746.5	1645.2	46.60	17.97	31.40	1095
95	196.298	14749.	2.894	838.6	1808.8	47.59	18.87	31.87	1119
100	210.714	15839.	2.882	935.2	1976.6	48.58	19.77	32.41	1142
0.0210 GMOLE/CM^3 ISOCHORE									
* 32.517	11.928	232.2	2.784	-112.9	-55.4	31.50	14.41	263.83	462
33	13.322	365.2	2.845	-106.0	-41.7	31.72	14.30	182.35	484
34	16.221	640.6	2.935	-91.8	-13.5	32.14	14.10	119.19	522
35	19.193	898.8	2.990	-77.8	14.8	32.55	13.93	93.93	552
36	22.202	1152.	3.024	-63.9	43.2	32.94	13.83	79.51	577
37	25.242	1404.	3.050	-50.1	71.7	33.31	13.73	70.05	600
38	28.302	1657.	3.058	-36.5	100.1	33.68	13.66	62.92	619
39	31.376	1910.	3.073	-22.8	128.6	34.03	13.60	57.89	639
40	34.457	2162.	3.085	-9.3	157.0	34.38	13.54	54.01	658
42	40.658	2663.	3.104	17.7	213.9	35.03	13.47	48.38	693
44	46.886	3164.	3.116	44.6	270.9	35.66	13.43	44.45	725
46	53.117	3665.	3.123	71.5	327.8	36.26	13.45	41.57	755
48	59.361	4167.	3.126	98.5	384.9	36.83	13.50	39.40	781
50	65.610	4667.	3.127	125.5	442.1	37.39	13.57	37.69	806
55	81.222	5889.	3.122	193.9	585.8	38.69	13.81	34.72	863
60	96.786	7106.	3.110	264.2	731.2	39.91	14.09	32.85	913
65	112.317	8309.	3.095	335.5	877.5	41.05	14.47	31.70	956
70	127.766	9499.	3.080	409.1	1025.6	42.15	14.98	31.04	995
75	143.119	10670.	3.064	485.6	1176.1	43.20	15.61	30.77	1028
80	158.391	11835.	3.048	565.4	1329.6	44.23	16.33	30.77	1058
85	173.615	12995.	3.033	649.0	1486.7	45.24	17.14	30.97	1086
90	188.781	14140.	3.019	736.9	1647.8	46.25	18.00	31.33	1112
95	203.798	15255.	3.005	829.1	1812.5	47.25	18.90	31.81	1136
100	218.764	16368.	2.991	925.9	1981.4	48.24	19.80	32.36	1160
0.0215 GMOLE/CM^3 ISOCHORE									
* 32.397	11.720	304.8	3.032	-123.9	-68.7	31.12	14.12	228.29	498
33	13.533	479.7	3.057	-115.4	-51.6	31.38	14.03	154.94	516
34	16.573	769.7	3.093	-101.5	-23.4	31.80	13.90	106.53	544
35	19.677	1041.	3.123	-87.6	5.1	32.20	13.80	85.72	570
36	22.816	1305.	3.148	-73.8	33.7	32.59	13.72	73.65	593
37	25.984	1568.	3.169	-60.2	62.3	32.96	13.65	65.60	615
38	29.174	1831.	3.187	-46.5	90.9	33.33	13.59	59.80	636
39	32.376	2093.	3.202	-33.0	119.6	33.68	13.54	55.40	656
40	35.585	2354.	3.214	-19.5	148.2	34.02	13.49	51.95	675
42	42.041	2873.	3.231	7.5	205.6	34.68	13.43	46.89	710
44	48.523	3390.	3.243	34.3	263.0	35.30	13.41	43.33	742
46	55.009	3906.	3.249	61.1	320.4	35.90	13.43	40.68	771
48	61.505	4418.	3.252	88.1	377.9	36.48	13.49	38.68	798
50	68.005	4928.	3.252	115.1	435.6	37.03	13.57	37.09	823
55	84.241	6194.	3.246	183.6	580.6	38.33	13.82	34.32	879
60	100.423	7444.	3.233	253.9	727.2	39.56	14.11	32.57	929
65	116.562	8677.	3.217	325.4	874.7	40.70	14.50	31.49	973
70	132.614	9896.	3.200	399.1	1024.1	41.79	15.01	30.88	1012
75	148.559	11095.	3.183	475.6	1175.8	42.85	15.64	30.65	1045
80	164.420	12288.	3.166	555.6	1330.5	43.88	16.36	30.66	1076
85	180.232	13475.	3.149	639.4	1488.8	44.90	17.17	30.88	1104
90	195.976	14644.	3.133	727.4	1651.0	45.90	18.03	31.26	1129
95	211.558	15787.	3.118	819.8	1816.8	46.90	18.93	31.75	1154
100	227.086	16924.	3.103	916.7	1986.9	47.90	19.83	32.30	1177

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0220 GMOLE/CM^3 ISOCHORE									
* 32.261	11.487	394.5	3.165	-135.3	-82.4	30.73	13.98	185.50	513
33	13.806	618.1	3.195	-125.0	-61.4	31.05	13.89	128.00	535
34	16.995	920.8	3.230	-111.2	-32.9	31.46	13.78	94.45	563
35	20.237	1204.	3.260	-97.4	-4.2	31.86	13.70	78.37	588
36	23.511	1480.	3.284	-83.8	24.5	32.25	13.63	68.54	612
37	26.814	1754.	3.304	-70.2	53.3	32.62	13.58	61.80	633
38	30.137	2027.	3.321	-56.6	82.2	32.98	13.53	56.83	654
39	33.473	2298.	3.335	-43.1	111.1	33.33	13.49	53.00	674
40	36.815	2569.	3.347	-29.6	139.9	33.67	13.45	49.95	693
42	43.535	3105.	3.363	-2.8	197.7	34.33	13.40	45.43	727
44	50.279	3638.	3.374	24.0	255.6	34.95	13.39	42.21	759
46	57.027	4171.	3.379	50.8	313.5	35.55	13.42	39.79	788
48	63.783	4697.	3.382	77.7	371.5	36.12	13.49	37.95	815
50	70.542	5222.	3.381	104.8	429.7	36.67	13.57	36.49	840
55	87.420	6524.	3.373	173.3	575.9	37.98	13.83	33.91	896
60	104.234	7806.	3.358	243.7	723.7	39.20	14.13	32.27	947
65	120.998	9070.	3.341	315.2	872.5	40.35	14.52	31.27	991
70	137.667	10319.	3.323	389.1	1023.1	41.44	15.04	30.71	1029
75	154.218	11546.	3.304	465.8	1176.1	42.50	15.66	30.51	1063
80	170.683	12768.	3.286	545.9	1332.0	43.54	16.39	30.55	1094
85	187.094	13979.	3.268	629.9	1491.6	44.55	17.20	30.79	1122
90	203.430	15173.	3.250	718.0	1655.0	45.56	18.07	31.18	1147
95	219.590	16346.	3.233	810.6	1822.0	46.56	18.96	31.68	1172
100	235.692	17506.	3.217	907.7	1993.2	47.56	19.86	32.24	1195
0.0225 GMOLE/CM^3 ISOCHORE									
* 32.106	11.227	503.0	3.304	-147.0	-96.4	30.34	13.86	153.36	529
33	14.155	783.0	3.340	-134.6	-70.9	30.72	13.76	107.87	555
34	17.498	1096.	3.374	-120.9	-42.1	31.12	13.67	84.34	583
35	20.885	1391.	3.402	-107.2	-13.2	31.52	13.60	71.88	608
36	24.300	1679.	3.425	-93.7	15.8	31.90	13.55	63.89	631
37	27.742	1964.	3.445	-80.1	44.8	32.27	13.51	58.26	652
38	31.205	2246.	3.461	-66.7	73.9	32.63	13.47	54.02	673
39	34.678	2527.	3.474	-53.2	103.0	32.98	13.44	50.70	692
40	38.159	2808.	3.484	-39.8	132.1	33.32	13.41	48.01	711
42	45.151	3367.	3.500	-13.0	190.3	33.98	13.37	43.99	746
44	52.165	3911.	3.509	13.7	248.7	34.60	13.38	41.10	777
46	59.184	4459.	3.514	40.5	307.1	35.20	13.42	38.90	806
48	66.207	5007.	3.515	67.4	365.6	35.77	13.49	37.22	833
50	73.231	5541.	3.514	94.5	424.3	36.32	13.58	35.87	858
55	90.769	6879.	3.503	163.0	571.8	37.63	13.85	33.49	914
60	108.233	8194.	3.487	233.5	720.9	38.85	14.15	31.97	965
65	125.637	9489.	3.468	305.2	871.0	40.00	14.55	31.04	1009
70	142.938	10769.	3.448	379.2	1022.9	41.10	15.06	30.54	1047
75	160.109	12023.	3.428	456.1	1177.1	42.16	15.69	30.37	1081
80	177.192	13274.	3.408	536.3	1334.3	43.19	16.42	30.44	1112
85	194.216	14511.	3.389	620.4	1495.1	44.21	17.23	30.70	1140
90	211.154	15729.	3.370	708.8	1659.6	45.22	18.10	31.10	1166
95	227.908	16937.	3.351	801.5	1827.8	46.22	18.99	31.61	1190
100	244.597	18116.	3.333	898.7	2000.2	47.22	19.90	32.17	1213
0.0230 GMOLE/CM^3 ISOCHORE									
* 31.934	10.943	641.8	3.445	-158.8	-110.6	29.93	13.74	126.86	546
32	11.170	662.5	3.448	-157.9	-108.7	29.96	13.74	123.73	548
33	14.594	976.3	3.487	-144.2	-79.9	30.38	13.64	92.38	576
34	18.095	1298.	3.520	-130.6	-50.9	30.79	13.57	75.74	603
35	21.633	1604.	3.547	-117.1	-21.8	31.18	13.52	66.11	628
36	25.195	1904.	3.570	-103.6	7.4	31.56	13.48	59.64	651
37	28.782	2199.	3.589	-90.1	36.7	31.93	13.45	54.95	672
38	32.388	2491.	3.604	-76.7	66.0	32.29	13.42	51.36	692
39	36.004	2787.	3.616	-63.3	95.3	32.64	13.39	48.51	712
40	39.628	3073.	3.626	-49.9	124.7	32.97	13.37	46.15	730
42	46.902	3644.	3.640	-23.2	183.4	33.63	13.35	42.60	765
44	54.194	4209.	3.648	3.5	242.3	34.25	13.36	40.01	796
46	61.491	4774.	3.652	30.3	301.2	34.84	13.41	38.02	825
48	68.789	5332.	3.652	57.2	360.3	35.42	13.49	36.49	851
50	76.087	5886.	3.650	84.3	419.5	35.97	13.58	35.26	876
55	94.303	7259.	3.637	152.9	568.3	37.28	13.87	33.07	933
60	112.432	8608.	3.619	223.5	718.8	38.51	14.17	31.66	983
65	130.491	9934.	3.598	295.3	870.1	39.66	14.57	30.80	1027
70	148.440	11245.	3.577	369.4	1023.3	40.75	15.09	30.35	1066
75	166.246	12529.	3.555	446.4	1178.8	41.82	15.72	30.22	1100
80	183.962	13808.	3.534	526.8	1337.2	42.85	16.46	30.31	1131
85	201.610	15070.	3.513	611.1	1499.3	43.88	17.27	30.60	1159
90	219.163	16312.	3.492	699.6	1665.1	44.89	18.13	31.02	1184
95	236.527	17547.	3.472	792.5	1834.5	45.89	19.03	31.53	1209
100	253.813	18755.	3.453	889.9	2008.0	46.89	19.93	32.11	1232

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0235 GMOLE/CM^3 ISOCHORE									
* 31.742	10.634	785.3	3.597	-170.9	-125.1	29.52	13.63	109.58	563
32	11.552	870.4	3.608	-167.4	-117.6	29.63	13.61	101.41	571
33	15.137	1200.	3.645	-153.9	-88.6	30.05	13.54	80.56	599
34	18.801	1529.	3.676	-140.3	-59.3	30.45	13.48	68.61	625
35	22.494	1846.	3.701	-126.9	-29.9	30.84	13.44	61.10	649
36	26.209	2157.	3.722	-113.5	-0.5	31.22	13.41	55.84	672
37	29.946	2462.	3.739	-100.1	29.1	31.59	13.39	51.94	693
38	33.701	2764.	3.753	-86.7	58.6	31.94	13.37	48.90	713
39	37.465	3065.	3.764	-73.3	88.2	32.29	13.35	46.44	732
40	41.236	3365.	3.773	-60.0	117.8	32.63	13.34	44.39	750
42	48.800	3956.	3.785	-33.3	177.1	33.28	13.33	41.25	784
44	56.379	4536.	3.792	-6.6	236.5	33.90	13.35	38.94	815
46	63.962	5117.	3.794	20.1	295.9	34.50	13.41	37.15	844
48	71.544	5691.	3.793	47.0	355.5	35.07	13.49	35.76	871
50	79.122	6260.	3.790	74.1	415.3	35.62	13.59	34.64	895
55	98.033	7669.	3.775	142.8	565.5	36.93	13.88	32.63	952
60	116.846	9051.	3.754	213.5	717.3	38.16	14.19	31.34	1002
65	135.576	10409.	3.732	285.4	870.0	39.31	14.60	30.56	1046
70	154.187	11750.	3.708	359.7	1024.5	40.41	15.12	30.16	1085
75	172.643	13065.	3.685	436.8	1181.2	41.48	15.76	30.06	1119
80	191.006	14372.	3.662	517.4	1341.0	42.52	16.49	30.18	1150
85	209.290	15657.	3.639	601.9	1504.3	43.54	17.30	30.49	1178
90	227.470	16924.	3.617	690.5	1671.3	44.55	18.17	30.93	1203
95	245.461	18192.	3.596	783.6	1842.0	45.56	19.07	31.45	1228
100	263.356	19423.	3.575	881.2	2016.7	46.56	19.97	32.04	1252
0.0240 GMOLE/CM^3 ISOCHORE									
* 31.532	10.303	950.1	3.755	-183.3	-139.8	29.10	13.53	95.83	582
32	12.046	1111.	3.773	-177.0	-126.1	29.30	13.50	85.60	595
33	15.799	1456.	3.808	-163.5	-96.8	29.71	13.44	71.24	623
34	19.629	1791.	3.836	-150.1	-67.2	30.11	13.40	62.56	648
35	23.483	2117.	3.860	-136.7	-37.6	30.50	13.37	56.69	672
36	27.356	2439.	3.879	-123.3	-7.8	30.88	13.35	52.41	694
37	31.249	2755.	3.895	-110.0	21.9	31.24	13.34	49.17	714
38	35.157	3067.	3.907	-96.7	51.8	31.60	13.33	46.60	734
39	39.074	3377.	3.917	-83.3	81.6	31.94	13.32	44.49	753
40	42.998	3687.	3.925	-70.0	111.5	32.28	13.31	42.71	771
42	50.862	4295.	3.935	-43.4	171.3	32.93	13.31	39.95	805
44	58.735	4897.	3.940	-16.7	231.2	33.55	13.35	37.90	836
46	66.612	5489.	3.940	10.0	291.3	34.15	13.41	36.30	864
48	74.485	6079.	3.938	36.9	351.4	34.72	13.50	35.04	891
50	82.351	6663.	3.933	64.0	411.7	35.27	13.60	34.02	915
55	101.976	8107.	3.916	132.8	563.3	36.58	13.90	32.20	971
60	121.488	9523.	3.893	203.6	716.5	37.82	14.22	31.01	1022
65	140.905	10913.	3.868	275.6	870.5	38.97	14.63	30.31	1066
70	160.195	12285.	3.843	350.1	1026.4	40.07	15.15	29.96	1105
75	179.316	13631.	3.818	427.4	1184.4	41.14	15.79	29.90	1139
80	198.339	14967.	3.793	508.1	1345.5	42.18	16.52	30.05	1170
85	217.272	16275.	3.769	592.7	1510.0	43.21	17.34	30.38	1197
90	236.092	17566.	3.745	681.6	1678.3	44.22	18.20	30.84	1223
95	254.724	18867.	3.722	774.8	1850.3	45.23	19.10	31.37	1248
100	273.241	20121.	3.699	872.6	2026.2	46.23	20.01	31.97	1271
0.0245 GMOLE/CM^3 ISOCHORE									
* 31.301	9.949	1137.	3.917	-195.9	-154.8	28.67	13.43	84.75	600
32	12.669	1388.	3.944	-186.5	-134.2	28.97	13.40	73.94	620
33	16.598	1746.	3.976	-173.2	-104.5	29.38	13.35	63.78	647
34	20.597	2086.	4.002	-159.8	-74.6	29.78	13.33	57.40	672
35	24.617	2422.	4.024	-146.5	-44.7	30.16	13.31	52.80	695
36	28.653	2754.	4.041	-133.2	-14.7	30.54	13.30	49.33	717
37	32.707	3081.	4.055	-119.9	15.4	30.90	13.30	46.63	737
38	36.773	3402.	4.066	-106.6	45.5	31.26	13.30	44.47	756
39	40.847	3721.	4.074	-93.3	75.6	31.60	13.29	42.67	775
40	44.929	4040.	4.081	-80.0	105.8	31.94	13.29	41.12	793
42	53.101	4666.	4.089	-53.4	166.2	32.59	13.30	38.70	826
44	61.276	5279.	4.091	-26.8	226.6	33.21	13.34	36.89	857
46	69.456	5892.	4.090	-0.0	287.2	33.80	13.41	35.46	885
48	77.628	6498.	4.086	26.9	347.9	34.38	13.51	34.33	911
50	85.790	7097.	4.080	54.0	408.8	34.93	13.62	33.42	936
55	106.146	8577.	4.060	122.8	561.8	36.24	13.92	31.76	992
60	126.374	10026.	4.035	193.8	716.4	37.48	14.24	30.69	1042
65	146.495	11449.	4.008	266.0	871.8	38.63	14.66	30.05	1086
70	166.478	12852.	3.981	340.5	1029.0	39.74	15.18	29.75	1125
75	186.279	14229.	3.953	418.0	1188.4	40.80	15.82	29.73	1159
80	205.978	15593.	3.927	498.9	1350.8	41.85	16.56	29.91	1190
85	225.570	16924.	3.901	583.7	1516.6	42.88	17.37	30.27	1217
90	245.042	18241.	3.875	672.8	1686.2	43.89	18.24	30.75	1243
95	264.332	19573.	3.850	766.2	1859.4	44.90	19.14	31.29	1268
100	283.483	20851.	3.826	864.2	2036.6	45.91	20.05	31.90	1291

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0250 GMOLE/CM^3 ISOCHORE									
* 31.050	9.574	1349.	4.086	-208.8	-170.0	28.23	13.34	75.64	620
32	13.440	1701.	4.120	-196.1	-141.7	28.63	13.31	65.06	647
33	17.552	2072.	4.149	-182.8	-111.7	29.04	13.28	57.72	673
34	21.721	2417.	4.173	-169.6	-81.5	29.44	13.26	52.98	697
35	25.911	2762.	4.192	-156.3	-51.3	29.82	13.26	49.36	719
36	30.116	3104.	4.208	-143.1	-21.0	30.19	13.26	46.54	740
37	34.335	3440.	4.220	-129.8	9.4	30.56	13.26	44.31	760
38	38.565	3771.	4.229	-116.5	39.8	30.91	13.27	42.49	779
39	42.800	4098.	4.236	-103.3	70.2	31.26	13.27	40.96	797
40	47.044	4427.	4.241	-90.0	100.7	31.59	13.28	39.63	815
42	55.533	5070.	4.247	-63.4	161.7	32.24	13.30	37.52	848
44	64.020	5700.	4.247	-36.8	222.7	32.86	13.34	35.92	878
46	72.510	6328.	4.244	-10.0	283.9	33.46	13.42	34.65	906
48	80.989	6950.	4.239	16.9	345.2	34.03	13.52	33.64	932
50	89.454	7564.	4.231	44.1	406.6	34.59	13.63	32.82	957
55	110.559	9079.	4.208	113.0	561.1	35.90	13.95	31.33	1013
60	131.520	10567.	4.180	184.1	717.1	37.14	14.27	30.36	1063
65	152.360	12018.	4.151	256.4	873.9	38.29	14.69	29.79	1107
70	173.052	13457.	4.121	331.1	1032.5	39.40	15.22	29.55	1146
75	193.550	14869.	4.092	408.8	1193.2	40.47	15.86	29.56	1180
80	213.937	16251.	4.063	489.9	1357.0	41.52	16.59	29.77	1211
85	234.201	17606.	4.035	574.9	1524.1	42.55	17.41	30.16	1238
90	254.338	18949.	4.008	664.1	1694.9	43.57	18.28	30.65	1264
95	274.302	20317.	3.981	757.7	1869.5	44.58	19.18	31.20	1289
100	294.098	21614.	3.955	855.9	2047.9	45.59	20.09	31.82	1312
0.0255 GMOLE/CM^3 ISOCHORE									
* 30.778	9.180	1572.	4.258	-221.9	-185.4	27.78	13.26	68.55	639
31	10.116	1660.	4.266	-219.0	-178.8	27.88	13.25	66.21	646
32	14.377	2054.	4.299	-205.7	-148.6	28.30	13.23	58.09	673
33	18.677	2436.	4.326	-192.5	-118.3	28.70	13.21	52.72	699
34	23.020	2786.	4.348	-179.3	-87.8	29.10	13.21	49.16	722
35	27.385	3139.	4.365	-166.1	-57.3	29.48	13.21	46.31	744
36	31.764	3491.	4.378	-152.9	-26.7	29.85	13.22	44.03	764
37	36.153	3836.	4.389	-139.7	4.0	30.22	13.23	42.19	784
38	40.550	4175.	4.397	-126.4	34.7	30.57	13.25	40.66	803
39	44.951	4512.	4.402	-113.2	65.5	30.91	13.26	39.36	821
40	49.361	4848.	4.406	-99.9	96.2	31.25	13.26	38.22	838
42	58.177	5509.	4.409	-73.3	157.8	31.90	13.29	36.39	871
44	66.983	6156.	4.407	-46.7	219.4	32.52	13.35	34.98	901
46	75.791	6800.	4.402	-19.9	281.2	33.11	13.43	33.86	928
48	84.584	7437.	4.395	7.0	343.1	33.69	13.53	32.96	954
50	93.360	8066.	4.386	34.2	405.2	34.24	13.65	32.23	978
55	115.231	9616.	4.359	103.3	561.1	35.56	13.97	30.90	1034
60	136.942	11137.	4.328	174.4	718.6	36.80	14.30	30.03	1084
65	158.518	12621.	4.296	246.9	876.8	37.96	14.72	29.53	1128
70	179.935	14085.	4.265	321.8	1036.8	39.07	15.25	29.34	1167
75	201.145	15525.	4.233	399.6	1198.9	40.14	15.89	29.38	1201
80	222.235	16944.	4.203	480.9	1364.0	41.19	16.63	29.63	1232
85	243.182	18324.	4.173	566.1	1532.4	42.22	17.45	30.03	1259
90	263.997	19694.	4.143	655.5	1704.5	43.24	18.32	30.55	1285
95	284.650	21084.	4.115	749.4	1880.4	44.26	19.22	31.11	1310
100	305.102	22409.	4.087	847.8	2060.1	45.27	20.13	31.75	1333
0.0260 GMOLE/CM^3 ISOCHORE									
* 30.484	8.767	1842.	4.439	-235.3	-201.1	27.32	13.18	62.04	660
31	11.041	2049.	4.457	-228.5	-185.5	27.54	13.17	58.22	675
32	15.501	2448.	4.486	-215.3	-154.9	27.96	13.16	52.59	701
33	19.994	2838.	4.510	-202.2	-124.3	28.37	13.16	48.60	726
34	24.513	3195.	4.529	-189.0	-93.5	28.76	13.16	45.88	748
35	29.057	3556.	4.543	-175.8	-62.6	29.14	13.17	43.62	769
36	33.614	3916.	4.554	-162.7	-31.7	29.51	13.19	41.77	789
37	38.178	4270.	4.563	-149.5	-0.7	29.87	13.21	40.25	809
38	42.747	4619.	4.569	-136.2	30.3	30.23	13.23	38.97	827
39	47.319	4964.	4.573	-123.0	61.4	30.57	13.24	37.87	845
40	51.899	5308.	4.575	-109.8	92.5	30.91	13.26	36.90	862
42	61.049	5985.	4.575	-83.2	154.7	31.55	13.30	35.31	894
44	70.182	6649.	4.571	-56.6	216.9	32.17	13.35	34.08	923
46	79.316	7308.	4.564	-29.7	279.4	32.77	13.44	33.09	951
48	88.432	7961.	4.555	-2.8	341.9	33.35	13.55	32.30	977
50	97.526	8604.	4.544	24.5	404.5	33.90	13.67	31.66	1001
55	120.180	10188.	4.514	93.6	562.0	35.22	14.00	30.48	1056
60	142.657	11737.	4.480	164.9	720.9	36.46	14.33	29.71	1106
65	164.987	13260.	4.446	237.6	880.6	37.62	14.75	29.27	1150
70	187.143	14755.	4.411	312.6	1042.0	38.74	15.29	29.12	1189
75	209.081	16226.	4.378	390.6	1205.5	39.81	15.93	29.21	1223
80	230.888	17673.	4.345	472.1	1371.9	40.86	16.67	29.48	1253
85	252.531	19078.	4.313	557.5	1541.6	41.90	17.49	29.91	1281
90	274.039	20478.	4.281	647.1	1715.1	42.92	18.36	30.44	1306
95	295.392	21890.	4.251	741.2	1892.3	43.94	19.27	31.02	1331
100	316.513	23239.	4.221	839.8	2073.3	44.95	20.18	31.67	1354

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0265 GMOLE/CM^3 ISOCHORE									
* 30.168	8.339	2145.	4.625	-248.9	-217.0	26.85	13.10	56.50	682
31	12.172	2481.	4.651	-238.0	-191.5	27.21	13.10	52.10	704
32	16.832	2885.	4.677	-224.9	-160.6	27.63	13.10	48.11	730
33	21.522	3282.	4.698	-211.8	-129.5	28.03	13.11	45.13	754
34	26.222	3646.	4.714	-198.7	-98.4	28.42	13.12	43.02	775
35	30.948	4015.	4.726	-185.6	-67.2	28.80	13.14	41.23	796
36	35.687	4383.	4.735	-172.4	-36.0	29.17	13.17	39.73	815
37	40.430	4746.	4.741	-159.2	-4.6	29.53	13.20	38.48	834
38	45.175	5102.	4.745	-146.0	26.7	29.88	13.22	37.41	852
39	49.922	5456.	4.747	-132.8	58.1	30.23	13.24	36.48	869
40	54.675	5807.	4.748	-119.5	89.5	30.56	13.26	35.66	886
42	64.168	6500.	4.745	-93.0	152.4	31.21	13.30	34.29	918
44	73.639	7182.	4.739	-66.3	215.2	31.83	13.37	33.22	947
46	83.105	7854.	4.730	-39.5	278.3	32.43	13.46	32.36	974
48	92.551	8523.	4.719	-12.5	341.4	33.01	13.57	31.66	1000
50	101.970	9181.	4.706	14.8	404.7	33.56	13.69	31.09	1024
55	125.426	10799.	4.672	84.1	563.6	34.88	14.02	30.06	1079
60	148.685	12380.	4.635	155.5	724.0	36.13	14.36	29.38	1128
65	171.785	13936.	4.598	228.4	885.2	37.29	14.79	29.01	1172
70	194.696	15461.	4.561	303.6	1048.0	38.41	15.32	28.91	1211
75	217.377	16965.	4.525	381.8	1212.9	39.49	15.97	29.03	1245
80	239.914	18438.	4.490	463.4	1380.8	40.54	16.71	29.33	1275
85	262.267	19871.	4.455	549.0	1551.8	41.58	17.53	29.78	1303
90	284.483	21304.	4.422	638.8	1726.6	42.60	18.41	30.32	1328
95	306.546	22732.	4.389	733.1	1905.2	43.62	19.31	30.93	1353
100	328.347	24104.	4.357	832.0	2087.4	44.64	20.22	31.58	1376
0.0270 GMOLE/CM^3 ISOCHORE									
* 29.829	7.897	2466.	4.814	-262.8	-233.2	26.37	13.03	52.00	703
30	8.718	2538.	4.820	-260.6	-227.8	26.45	13.03	51.20	708
31	13.530	2960.	4.849	-247.5	-196.8	26.87	13.04	47.27	734
32	18.394	3367.	4.872	-234.5	-165.5	27.29	13.05	44.40	759
33	23.283	3769.	4.889	-221.4	-134.1	27.69	13.07	42.16	782
34	28.167	4142.	4.902	-208.3	-102.6	28.08	13.09	40.51	803
35	33.080	4518.	4.912	-195.2	-71.1	28.46	13.12	39.10	823
36	38.004	4894.	4.919	-182.1	-39.5	28.83	13.15	37.89	842
37	42.931	5264.	4.923	-168.9	-7.8	29.19	13.18	36.86	860
38	47.856	5629.	4.925	-155.7	23.9	29.54	13.21	35.97	878
39	52.781	5990.	4.925	-142.5	55.6	29.89	13.24	35.19	895
40	57.712	6348.	4.924	-129.3	87.3	30.22	13.26	34.50	911
42	67.555	7056.	4.919	-102.7	150.8	30.87	13.31	33.33	942
44	77.371	7755.	4.910	-76.0	214.3	31.49	13.38	32.39	971
46	87.177	8442.	4.899	-49.1	278.0	32.09	13.47	31.65	998
48	96.962	9125.	4.886	-22.1	341.8	32.67	13.59	31.04	1024
50	106.713	9797.	4.872	5.2	405.7	33.22	13.71	30.55	1047
55	130.986	11448.	4.833	74.6	566.2	34.55	14.05	29.65	1102
60	155.044	13063.	4.793	146.3	728.1	35.79	14.39	29.06	1151
65	178.930	14652.	4.753	219.3	890.7	36.96	14.82	28.75	1195
70	202.611	16206.	4.714	294.7	1055.0	38.08	15.36	28.70	1234
75	226.052	17742.	4.675	373.1	1221.4	39.16	16.01	28.85	1268
80	249.332	19241.	4.637	454.9	1390.6	40.22	16.75	29.18	1298
85	272.409	20707.	4.601	540.7	1563.0	41.26	17.57	29.65	1325
90	295.351	22176.	4.565	630.7	1739.1	42.28	18.45	30.20	1351
95	318.129	23610.	4.530	725.2	1919.1	43.31	19.36	30.83	1375
100	340.623	25005.	4.495	824.3	2102.6	44.32	20.27	31.50	1398
0.0275 GMOLE/CM^3 ISOCHORE									
* 29.466	7.442	2828.	5.009	-276.9	-249.5	25.88	12.96	47.99	725
30	10.115	3057.	5.025	-270.0	-232.7	26.11	12.97	46.17	740
31	15.140	3486.	5.051	-257.0	-201.2	26.54	12.99	43.38	765
32	20.208	3897.	5.070	-244.0	-169.6	26.95	13.01	41.30	788
33	25.298	4301.	5.085	-231.0	-137.8	27.35	13.04	39.62	810
34	30.371	4684.	5.096	-217.9	-106.0	27.74	13.07	38.32	831
35	35.474	5068.	5.103	-204.9	-74.2	28.12	13.10	37.20	850
36	40.588	5450.	5.107	-191.7	-42.2	28.49	13.14	36.23	869
37	45.701	5827.	5.109	-178.6	-10.2	28.85	13.18	35.39	887
38	50.811	6200.	5.110	-165.4	21.8	29.20	13.21	34.65	904
39	55.919	6568.	5.108	-152.2	53.9	29.54	13.24	34.00	921
40	61.031	6933.	5.106	-138.9	86.0	29.88	13.26	33.41	937
42	71.231	7656.	5.097	-112.3	150.1	30.53	13.32	32.42	968
44	81.401	8371.	5.085	-85.6	214.3	31.15	13.40	31.61	996
46	91.554	9072.	5.072	-58.7	278.6	31.75	13.50	30.97	1023
48	101.683	9769.	5.056	-31.6	343.1	32.33	13.61	30.45	1048
50	111.775	10456.	5.040	-4.2	407.6	32.88	13.74	30.02	1071
55	136.881	12139.	4.998	65.3	569.7	34.21	14.08	29.25	1126
60	161.755	13786.	4.954	137.1	733.1	35.46	14.43	28.74	1175
65	186.443	15408.	4.911	210.3	897.2	36.63	14.86	28.49	1219
70	210.909	16991.	4.869	285.9	1063.0	37.75	15.40	28.49	1257
75	235.126	18558.	4.828	364.5	1230.8	38.84	16.05	28.67	1291
80	259.162	20084.	4.789	446.5	1401.4	39.89	16.79	29.03	1321
85	282.981	21586.	4.750	532.5	1575.2	40.94	17.62	29.52	1348
90	306.667	23096.	4.713	622.8	1752.7	41.97	18.49	30.09	1374
95	330.162	24526.	4.676	717.5	1934.0	42.99	19.40	30.75	1398

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE	PRESSURE	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE	INTERNAL ENERGY	ENTHALPY	ENTROPY	C_v, HEAT CAPACITY	C_p, HEAT CAPACITY	VELOCITY OF SOUND
DEG. KELVIN	ATM	CM^3ATM/GMOLE	ATM/K	J/GMOLE	J/GMOLE	J/GMOLE-K	J/GMOLE-K	J/GMOLE-K	METER/SEC
0.0280 GMOLE/CM^3 ISOCHORE									
* 29.080	6.980	3229.	5.212	-291.3	-266.0	25.37	12.90	44.52	748
30	11.783	3628.	5.237	-279.4	-236.8	25.77	12.92	42.23	772
31	17.024	4061.	5.258	-266.5	-204.9	26.20	12.94	40.22	796
32	22.298	4475.	5.274	-253.5	-172.8	26.61	12.98	38.68	819
33	27.592	4881.	5.285	-240.5	-140.7	27.01	13.01	37.42	840
34	32.859	5275.	5.292	-227.5	-108.6	27.40	13.05	36.38	860
35	38.155	5666.	5.297	-214.4	-76.3	27.78	13.09	35.49	879
36	43.462	6054.	5.299	-201.3	-44.0	28.15	13.14	34.71	897
37	48.766	6438.	5.299	-188.1	-11.7	28.51	13.18	34.03	914
38	54.064	6818.	5.297	-174.9	20.7	28.86	13.22	33.43	931
39	59.357	7193.	5.294	-161.7	53.1	29.20	13.25	32.88	947
40	64.653	7564.	5.289	-148.4	85.5	29.54	13.27	32.40	963
42	75.218	8300.	5.278	-121.8	150.4	30.19	13.34	31.55	993
44	85.749	9032.	5.264	-95.1	215.2	30.81	13.42	30.86	1022
46	96.256	9746.	5.248	-68.1	280.2	31.41	13.52	30.32	1048
48	106.738	10457.	5.231	-41.0	345.3	31.99	13.64	29.87	1073
50	117.176	11158.	5.213	-13.6	410.5	32.55	13.77	29.51	1096
55	143.132	12873.	5.166	56.1	574.1	33.88	14.12	28.85	1150
60	168.837	14552.	5.119	128.1	739.1	35.13	14.46	28.43	1199
65	194.345	16206.	5.073	201.5	904.8	36.30	14.90	28.24	1243
70	219.609	17818.	5.028	277.3	1072.0	37.43	15.44	28.28	1281
75	244.617	19415.	4.985	356.0	1241.2	38.51	16.09	28.49	1315
80	269.423	20968.	4.942	438.3	1413.3	39.57	16.83	28.88	1345
85	294.004	22514.	4.901	524.5	1588.4	40.62	17.66	29.38	1372
90	318.456	24071.	4.861	615.0	1767.4	41.65	18.54	29.96	1398
95	342.661	25480.	4.822	710.0	1950.0	42.68	19.45	30.65	1421
0.0285 GMOLE/CM^3 ISOCHORE									
* 28.668	6.509	3697.	5.419	-305.9	-282.8	24.85	12.84	41.24	773
29	8.317	3836.	5.428	-301.6	-272.1	25.00	12.85	40.63	781
30	13.751	4253.	5.451	-288.8	-239.9	25.43	12.87	39.02	805
31	19.209	4688.	5.468	-275.9	-207.6	25.86	12.91	37.57	828
32	24.691	5104.	5.480	-262.9	-175.2	26.27	12.96	36.44	849
33	30.187	5511.	5.488	-250.0	-142.6	26.67	13.00	35.49	870
34	35.654	5917.	5.492	-236.9	-110.2	27.05	13.04	34.67	889
35	41.148	6314.	5.494	-223.9	-77.6	27.43	13.09	33.96	907
36	46.650	6708.	5.494	-210.8	-44.9	27.80	13.14	33.34	925
37	52.147	7098.	5.491	-197.6	-12.2	28.16	13.18	32.79	942
38	57.637	7485.	5.488	-184.4	20.5	28.52	13.23	32.30	958
39	63.120	7867.	5.483	-171.2	53.3	28.86	13.26	31.85	975
40	68.602	8243.	5.477	-157.9	86.0	29.20	13.29	31.45	990
42	79.540	8993.	5.462	-131.2	151.5	29.85	13.36	30.74	1020
44	90.440	9739.	5.445	-104.4	217.1	30.47	13.44	30.15	1048
46	101.307	10466.	5.427	-77.4	282.7	31.07	13.55	29.69	1074
48	112.148	11191.	5.408	-50.2	348.5	31.65	13.67	29.32	1098
50	122.940	11905.	5.388	-22.8	414.3	32.21	13.80	29.01	1122
55	149.761	13651.	5.338	47.1	579.5	33.54	14.15	28.47	1175
60	176.314	15369.	5.287	119.2	746.1	34.80	14.50	28.12	1224
65	202.656	17048.	5.238	192.8	913.3	35.98	14.93	27.99	1267
70	228.734	18688.	5.191	268.8	1082.0	37.10	15.48	28.07	1305
75	254.548	20314.	5.144	347.8	1252.7	38.19	16.13	28.32	1339
80	280.137	21893.	5.100	430.3	1426.2	39.26	16.88	28.73	1369
85	305.503	23493.	5.056	516.7	1602.8	40.30	17.70	29.24	1397
90	330.747	25104.	5.014	607.4	1783.3	41.34	18.59	29.83	1423
0.0290 GMOLE/CM^3 ISOCHORE									
* 28.229	6.033	4176.	5.625	-320.8	-299.7	24.31	12.77	38.54	796
29	10.400	4506.	5.645	-310.9	-274.6	24.66	12.80	37.52	815
30	16.046	4934.	5.665	-298.1	-242.0	25.09	12.84	36.35	838
31	21.721	5369.	5.679	-285.2	-209.3	25.51	12.89	35.32	860
32	27.412	5787.	5.688	-272.3	-176.5	25.92	12.94	34.49	881
33	33.111	6194.	5.693	-259.3	-143.6	26.32	12.99	33.79	900
34	38.784	6611.	5.695	-246.3	-110.8	26.71	13.04	33.14	919
35	44.478	7015.	5.695	-233.3	-77.9	27.09	13.09	32.59	937
36	50.178	7413.	5.692	-220.1	-44.8	27.46	13.14	32.10	954
37	55.872	7809.	5.688	-207.0	-11.8	27.82	13.19	31.66	971
38	61.557	8203.	5.682	-193.8	21.3	28.17	13.24	31.26	987
39	67.233	8591.	5.675	-180.5	54.4	28.52	13.27	30.89	1002
40	72.904	8973.	5.668	-167.2	87.5	28.85	13.31	30.56	1018
42	84.219	9734.	5.650	-140.5	153.7	29.50	13.38	29.97	1047
44	95.497	10495.	5.630	-113.7	220.0	30.13	13.47	29.48	1075
46	106.731	11235.	5.610	-86.6	286.3	30.73	13.57	29.10	1100
48	117.937	11972.	5.588	-59.4	352.7	31.31	13.70	28.78	1124
50	129.089	12699.	5.566	-31.8	419.2	31.87	13.83	28.53	1147
55	156.791	14477.	5.512	38.2	586.0	33.21	14.19	28.09	1200
60	184.208	16220.	5.458	110.5	754.2	34.47	14.54	27.81	1249
65	211.400	17935.	5.406	184.3	922.9	35.65	14.97	27.74	1292
70	238.305	19603.	5.356	260.5	1093.1	36.78	15.52	27.86	1330
75	264.938	21256.	5.308	339.7	1265.3	37.87	16.17	28.15	1364
80	291.324	22862.	5.262	422.4	1440.2	38.94	16.92	28.59	1393
85	317.506	24526.	5.217	509.0	1618.4	39.99	17.75	29.11	1422
90	343.571	26202.	5.173	600.0	1800.4	41.03	18.63	29.71	1449

* TWO-PHASE BOUNDARY

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TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0295 GMOLE/CM^3 ISOCHORE									
* 27.764	5.555	4692.	5.847	-335.8	-316.8	23.76	12.71	36.26	820
28	6.950	4796.	5.853	-332.8	-309.0	23.87	12.72	36.01	826
29	12.833	5235.	5.873	-320.1	-276.0	24.32	12.77	35.01	849
30	18.695	5672.	5.886	-307.3	-243.1	24.75	12.82	34.15	872
31	24.587	6105.	5.895	-294.5	-210.0	25.17	12.87	33.42	893
32	30.487	6525.	5.899	-281.6	-176.8	25.58	12.93	32.80	912
33	36.391	6934.	5.901	-268.6	-143.6	25.98	12.98	32.28	931
34	42.274	7360.	5.900	-255.6	-110.4	26.37	13.04	31.76	949
35	48.172	7769.	5.897	-242.5	-77.1	26.75	13.10	31.33	967
36	54.072	8173.	5.892	-229.4	-43.7	27.12	13.15	30.95	983
37	59.965	8573.	5.885	-216.2	-10.3	27.48	13.21	30.61	999
38	65.849	8973.	5.878	-203.0	23.2	27.83	13.25	30.29	1015
39	71.720	9367.	5.869	-189.7	56.6	28.18	13.29	29.99	1031
40	77.584	9754.	5.860	-176.4	90.1	28.51	13.33	29.72	1046
42	89.283	10528.	5.840	-149.7	157.0	29.16	13.40	29.25	1074
44	100.944	11302.	5.818	-122.8	223.9	29.79	13.49	28.84	1102
46	112.551	12054.	5.796	-95.7	290.9	30.40	13.60	28.53	1127
48	124.128	12802.	5.773	-68.3	358.0	30.98	13.73	28.28	1151
50	135.647	13543.	5.749	-40.7	425.2	31.54	13.87	28.07	1174
55	164.246	15350.	5.691	29.5	593.6	32.88	14.22	27.73	1226
60	192.542	17124.	5.633	102.0	763.3	34.14	14.58	27.52	1275
65	220.599	18869.	5.577	175.9	933.6	35.32	15.02	27.49	1318
70	248.345	20586.	5.523	252.3	1105.3	36.46	15.56	27.65	1355
75	275.811	22247.	5.471	331.7	1279.1	37.55	16.22	27.97	1389
80	303.006	23876.	5.420	414.7	1455.4	38.62	16.97	28.43	1418
85	330.040	25620.	5.370	501.5	1635.1	39.67	17.80	28.94	1447
0.0300 GMOLE/CM^3 ISOCHORE									
* 27.270	5.077	5263.	6.060	-351.2	-334.0	23.19	12.64	34.06	844
28	9.543	5584.	6.076	-341.9	-309.7	23.53	12.68	33.53	861
29	15.645	6024.	6.093	-329.2	-276.4	23.97	12.74	32.86	884
30	21.727	6468.	6.104	-316.4	-243.1	24.41	12.80	32.26	905
31	27.835	6898.	6.110	-303.6	-209.6	24.83	12.86	31.75	925
32	33.946	7320.	6.112	-290.7	-176.1	25.24	12.93	31.31	944
33	40.055	7731.	6.111	-277.8	-142.5	25.64	12.99	30.93	962
34	46.153	8165.	6.108	-264.7	-108.9	26.02	13.05	30.54	980
35	52.257	8580.	6.102	-251.7	-75.2	26.40	13.11	30.21	997
36	58.360	8987.	6.095	-238.5	-41.4	26.77	13.17	29.92	1013
37	64.454	9393.	6.087	-225.3	-7.6	27.14	13.22	29.66	1029
38	70.539	9798.	6.078	-212.1	26.2	27.49	13.27	29.40	1044
39	76.609	10198.	6.068	-198.8	60.0	27.83	13.31	29.16	1060
40	82.668	10591.	6.057	-185.5	93.7	28.17	13.35	28.95	1074
42	94.756	11375.	6.034	-158.7	161.4	28.82	13.43	28.56	1103
44	106.807	12160.	6.009	-131.7	229.0	29.45	13.52	28.23	1130
46	118.793	12924.	5.984	-104.6	296.7	30.06	13.64	27.98	1155
48	130.748	13684.	5.959	-77.2	364.4	30.64	13.77	27.79	1178
50	142.640	14437.	5.933	-49.5	432.3	31.21	13.90	27.63	1201
55	172.149	16274.	5.871	20.9	602.3	32.55	14.26	27.37	1253
60	201.340	18079.	5.810	93.6	773.6	33.81	14.62	27.23	1301
65	230.277	19857.	5.751	167.8	945.5	35.00	15.06	27.25	1344
70	258.877	21574.	5.695	244.4	1118.7	36.14	15.61	27.45	1381
75	287.188	23273.	5.641	324.0	1294.0	37.23	16.26	27.81	1414
80	315.207	24936.	5.589	407.2	1471.8	38.31	17.01	28.30	1444
85	343.136	26777.	5.538	494.3	1653.2	39.36	17.85	28.80	1474
0.0305 GMOLE/CM^3 ISOCHORE									
* 26.747	4.603	5915.	6.295	-366.7	-351.4	22.61	12.57	32.09	871
27	6.210	6020.	6.299	-363.5	-342.9	22.73	12.59	31.98	877
28	12.545	6435.	6.314	-350.9	-309.2	23.19	12.66	31.55	898
29	18.867	6875.	6.322	-338.2	-275.6	23.63	12.73	31.09	919
30	25.173	7324.	6.327	-325.5	-241.8	24.06	12.79	30.65	939
31	31.495	7751.	6.327	-312.6	-208.0	24.48	12.86	30.30	958
32	37.817	8175.	6.325	-299.8	-174.1	24.89	12.93	29.99	976
33	44.133	8590.	6.321	-286.8	-140.2	25.29	12.99	29.71	994
34	50.449	9028.	6.315	-273.8	-106.2	25.68	13.06	29.42	1011
35	56.761	9448.	6.307	-260.7	-72.1	26.06	13.12	29.17	1027
36	63.069	9860.	6.298	-247.5	-38.0	26.43	13.18	28.96	1043
37	69.367	10269.	6.288	-234.3	-3.9	26.79	13.24	28.76	1059
38	75.656	10680.	6.278	-221.0	30.3	27.15	13.30	28.57	1074
39	81.927	11084.	6.266	-207.7	64.4	27.49	13.34	28.39	1089
40	88.183	11483.	6.254	-194.4	98.6	27.83	13.38	28.22	1103
42	100.667	12277.	6.230	-167.5	166.9	28.49	13.46	27.92	1131
44	113.113	13077.	6.204	-140.5	235.3	29.11	13.55	27.66	1158
46	125.483	13847.	6.177	-113.3	303.6	29.72	13.67	27.47	1183
48	137.821	14617.	6.150	-85.8	372.0	30.31	13.80	27.33	1206
50	150.093	15387.	6.124	-58.1	440.6	30.87	13.94	27.21	1229
55	180.528	17249.	6.057	12.5	612.2	32.22	14.30	27.04	1280
60	210.629	19084.	5.991	85.4	785.2	33.49	14.66	26.95	1328
65	240.459	20883.	5.927	159.8	958.6	34.68	15.10	27.01	1370
70	269.927	22633.	5.864	236.6	1133.3	35.82	15.65	27.23	1407
75	299.092	24350.	5.803	316.5	1310.1	36.92	16.31	27.61	1439
80	327.950	26043.	5.742	399.9	1489.4	37.99	17.06	28.10	1468

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0310 GMOLE/CM^3 ISOCHORE									
* 26.194	4.137	6581.	6.515	-382.5	-369.0	22.00	12.51	30.32	895
27	9.444	6924.	6.528	-372.4	-341.5	22.38	12.57	30.09	913
28	15.988	7349.	6.539	-359.8	-307.5	22.84	12.64	29.82	933
29	22.531	7789.	6.544	-347.1	-273.5	23.29	12.72	29.53	953
30	29.061	8246.	6.546	-334.4	-239.4	23.72	12.79	29.24	973
31	35.597	8668.	6.544	-321.5	-205.2	24.14	12.86	29.02	991
32	42.131	9091.	6.540	-308.6	-170.9	24.55	12.94	28.81	1009
33	48.655	9511.	6.533	-295.7	-136.6	24.95	13.00	28.62	1026
34	55.191	9951.	6.525	-282.6	-102.2	25.34	13.07	28.41	1043
35	61.715	10375.	6.516	-269.5	-67.8	25.72	13.14	28.24	1059
36	68.229	10791.	6.505	-256.4	-33.3	26.09	13.20	28.09	1074
37	74.733	11204.	6.494	-243.1	1.1	26.45	13.26	27.95	1089
38	81.229	11619.	6.482	-229.8	35.7	26.80	13.32	27.81	1104
39	87.703	12028.	6.469	-216.5	70.2	27.15	13.36	27.67	1119
40	94.160	12432.	6.456	-203.1	104.7	27.49	13.40	27.54	1133
42	107.043	13236.	6.429	-176.2	173.7	28.15	13.49	27.32	1161
44	119.889	14039.	6.401	-149.1	242.7	28.78	13.59	27.12	1187
46	132.649	14826.	6.372	-121.8	311.7	29.39	13.70	26.99	1211
48	145.374	15605.	6.343	-94.3	380.9	29.97	13.84	26.89	1235
50	158.031	16382.	6.315	-66.5	450.0	30.54	13.97	26.81	1257
55	189.408	18278.	6.244	4.3	623.4	31.89	14.34	26.71	1308
60	220.433	20142.	6.174	77.4	797.9	33.16	14.70	26.67	1355
65	251.169	21965.	6.106	152.0	972.9	34.35	15.15	26.78	1397
70	281.519	23744.	6.039	229.1	1149.2	35.50	15.70	27.03	1434
75	311.546	25473.	5.974	309.2	1327.5	36.60	16.36	27.44	1465
80	341.258	27198.	5.910	392.8	1508.2	37.68	17.12	27.95	1494
0.0315 GMOLE/CM^3 ISOCHORE									
* 25.608	3.680	7291.	6.743	-398.5	-386.7	21.38	12.44	28.75	920
26	6.349	7461.	6.749	-393.6	-373.2	21.57	12.47	28.68	929
27	13.145	7894.	6.760	-381.1	-338.8	22.04	12.55	28.52	949
28	19.905	8328.	6.766	-368.5	-304.5	22.50	12.64	28.36	969
29	26.667	8767.	6.768	-355.9	-270.1	22.94	12.72	28.19	988
30	33.423	9219.	6.766	-343.1	-235.6	23.37	12.79	28.00	1007
31	40.172	9643.	6.762	-330.3	-201.1	23.79	12.87	27.88	1025
32	46.919	10071.	6.755	-317.4	-166.4	24.20	12.95	27.75	1042
33	53.654	10497.	6.746	-304.4	-131.8	24.60	13.02	27.63	1058
34	60.410	10935.	6.736	-291.3	-97.0	24.99	13.09	27.50	1075
35	67.147	11363.	6.725	-278.2	-62.2	25.37	13.16	27.38	1090
36	73.870	11782.	6.713	-265.0	-27.4	25.74	13.22	27.29	1105
37	80.581	12198.	6.701	-251.8	7.4	26.11	13.29	27.19	1120
38	87.285	12618.	6.687	-238.4	42.3	26.46	13.35	27.10	1135
39	93.965	13031.	6.673	-225.1	77.2	26.81	13.39	27.00	1149
40	100.626	13441.	6.659	-211.7	112.0	27.15	13.43	26.91	1163
42	113.912	14253.	6.630	-184.7	181.7	27.81	13.52	26.75	1190
44	127.162	15063.	6.600	-157.6	251.5	28.44	13.62	26.61	1216
46	140.319	15861.	6.570	-130.2	321.2	29.05	13.74	26.52	1241
48	153.435	16648.	6.539	-102.6	391.0	29.64	13.87	26.46	1263
50	166.484	17436.	6.509	-74.7	460.8	30.21	14.01	26.42	1285
55	198.815	19360.	6.433	-3.7	635.8	31.56	14.38	26.39	1336
60	230.779	21252.	6.359	69.6	811.9	32.84	14.74	26.40	1383
65	262.432	23098.	6.286	144.4	988.6	34.03	15.19	26.55	1424
70	293.680	24908.	6.215	221.7	1166.4	35.18	15.75	26.83	1460
75	324.572	26647.	6.145	302.1	1346.1	36.29	16.41	27.27	1492
0.0320 GMOLE/CM^3 ISOCHORE									
* 24.988	3.237	8036.	6.970	-414.8	-404.5	20.73	12.37	27.32	944
25	3.327	8041.	6.970	-414.6	-404.1	20.73	12.37	27.32	945
26	10.337	8508.	6.983	-402.2	-369.5	21.22	12.46	27.21	966
27	17.349	8937.	6.990	-389.7	-334.8	21.69	12.54	27.16	986
28	24.327	9377.	6.992	-377.1	-300.1	22.15	12.63	27.09	1005
29	31.309	9810.	6.990	-364.4	-265.3	22.59	12.72	27.01	1023
30	38.290	10260.	6.986	-351.7	-230.4	23.03	12.80	26.92	1041
31	45.251	10686.	6.979	-338.8	-195.6	23.45	12.88	26.86	1058
32	52.213	11116.	6.970	-325.9	-160.6	23.86	12.96	26.80	1075
33	59.163	11548.	6.960	-312.9	-125.6	24.26	13.04	26.73	1091
34	66.137	11987.	6.949	-299.8	-90.4	24.65	13.11	26.67	1107
35	73.088	12413.	6.936	-286.7	-55.3	25.03	13.18	26.60	1122
36	80.022	12835.	6.923	-273.5	-20.1	25.40	13.25	26.55	1137
37	86.941	13255.	6.909	-260.2	15.1	25.77	13.31	26.50	1151
38	93.856	13677.	6.895	-246.9	50.3	26.12	13.37	26.44	1166
39	100.744	14094.	6.880	-233.5	85.5	26.47	13.42	26.38	1180
40	107.611	14510.	6.865	-220.0	120.7	26.81	13.46	26.32	1194
42	121.306	15337.	6.834	-193.0	191.1	27.47	13.55	26.21	1221
44	134.962	16145.	6.802	-165.8	261.5	28.10	13.65	26.13	1246
46	148.520	16953.	6.770	-138.4	331.9	28.71	13.77	26.08	1270
48	162.032	17748.	6.738	-110.7	402.4	29.30	13.91	26.06	1293
50	175.477	18547.	6.706	-82.7	472.9	29.87	14.05	26.05	1315
55	208.777	20498.	6.626	-11.5	649.5	31.23	14.42	26.08	1365
60	241.694	22416.	6.547	62.0	827.3	32.51	14.79	26.14	1411
65	274.276	24284.	6.470	137.1	1005.5	33.71	15.24	26.33	1452
70	306.437	26127.	6.393	214.6	1184.9	34.86	15.80	26.64	1488
75	338.196	27859.	6.317	295.3	1366.1	35.97	16.47	27.10	1518

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0325 GMOLE/CM^3 ISOCHORE									
* 24.334	2.812	8865.	7.185	-431.2	-422.4	20.06	12.29	25.89	969
25	7.625	9167.	7.196	-423.0	-399.2	20.39	12.35	25.91	983
26	14.861	9608.	7.207	-410.6	-364.2	20.87	12.45	25.93	1003
27	22.088	10038.	7.213	-398.1	-329.2	21.35	12.54	25.96	1022
28	29.288	10482.	7.214	-385.5	-294.2	21.80	12.63	25.97	1041
29	36.489	10920.	7.211	-372.8	-259.1	22.25	12.73	25.97	1058
30	43.694	11366.	7.205	-360.0	-223.8	22.68	12.81	25.95	1076
31	50.868	11794.	7.197	-347.2	-188.6	23.10	12.89	25.95	1092
32	58.046	12226.	7.187	-334.3	-153.3	23.51	12.98	25.94	1108
33	65.213	12665.	7.175	-321.2	-117.9	23.91	13.05	25.92	1124
34	72.403	13094.	7.163	-308.2	-82.4	24.31	13.13	25.91	1140
35	79.570	13526.	7.149	-295.0	-46.9	24.69	13.20	25.89	1155
36	86.716	13952.	7.135	-281.7	-11.4	25.06	13.27	25.87	1169
37	93.846	14374.	7.120	-268.4	24.1	25.42	13.34	25.86	1183
38	100.973	14798.	7.104	-255.1	59.7	25.78	13.40	25.83	1197
39	108.069	15218.	7.088	-241.6	95.3	26.13	13.45	25.80	1211
40	115.146	15640.	7.072	-228.2	130.8	26.47	13.49	25.76	1225
42	129.253	16469.	7.039	-201.1	201.9	27.13	13.59	25.71	1252
44	143.317	17286.	7.006	-173.8	273.0	27.77	13.69	25.67	1276
46	157.281	18104.	6.972	-146.3	344.0	28.38	13.81	25.66	1300
48	171.193	18907.	6.938	-118.5	415.2	28.97	13.95	25.67	1322
50	185.040	19714.	6.905	-90.5	486.4	29.54	14.09	25.69	1344
55	219.323	21693.	6.821	-19.1	664.7	30.90	14.47	25.78	1394
60	253.205	23634.	6.738	54.7	844.1	32.19	14.84	25.89	1440
65	286.725	25521.	6.657	129.9	1023.9	33.39	15.29	26.12	1480
70	319.816	27402.	6.577	207.8	1204.9	34.55	15.85	26.45	1516
0.0330 GMOLE/CM^3 ISOCHORE									
* 23.642	2.406	9731.	7.401	-447.8	-440.4	19.36	12.20	24.58	993
24	5.059	9894.	7.409	-443.4	-427.9	19.54	12.24	24.63	1000
25	12.500	10350.	7.424	-431.1	-392.7	20.04	12.34	24.73	1021
26	19.956	10785.	7.433	-418.7	-357.5	20.53	12.44	24.83	1040
27	27.398	11214.	7.437	-406.3	-322.1	21.00	12.54	24.93	1059
28	34.820	11660.	7.436	-393.7	-286.8	21.46	12.64	24.99	1077
29	42.240	12096.	7.431	-381.0	-251.3	21.90	12.73	25.05	1094
30	49.668	12538.	7.424	-368.2	-215.7	22.34	12.82	25.09	1111
31	57.056	12970.	7.414	-355.3	-180.2	22.76	12.91	25.13	1127
32	64.451	13404.	7.403	-342.4	-144.5	23.17	12.99	25.17	1142
33	71.839	13848.	7.391	-329.4	-108.8	23.57	13.07	25.18	1158
34	79.241	14271.	7.377	-316.2	-72.9	23.96	13.15	25.22	1173
35	86.625	14703.	7.362	-303.1	-37.1	24.34	13.23	25.23	1187
36	93.984	15132.	7.347	-289.8	-1.2	24.72	13.30	25.25	1202
37	101.326	15556.	7.331	-276.5	34.7	25.08	13.37	25.26	1216
38	108.665	15983.	7.315	-263.1	70.6	25.44	13.43	25.27	1229
39	115.973	16405.	7.298	-249.6	106.5	25.79	13.48	25.26	1243
40	123.261	16833.	7.281	-236.1	142.4	26.13	13.53	25.25	1257
42	137.785	17668.	7.247	-209.0	214.1	26.79	13.62	25.23	1283
44	152.257	18487.	7.212	-181.6	285.9	27.43	13.72	25.24	1307
46	166.634	19316.	7.176	-154.0	357.6	28.05	13.85	25.26	1331
48	180.948	20124.	7.141	-126.2	429.4	28.64	13.99	25.30	1353
50	195.201	20940.	7.106	-98.1	501.3	29.21	14.13	25.35	1374
55	230.479	22943.	7.018	-26.5	681.2	30.58	14.51	25.50	1423
60	265.337	24905.	6.931	47.5	862.2	31.86	14.88	25.65	1469
65	299.805	26811.	6.846	123.1	1043.6	33.07	15.34	25.92	1509
70	333.848	28734.	6.762	201.1	1226.2	34.23	15.91	26.27	1544
0.0335 GMOLE/CM^3 ISOCHORE									
* 22.912	2.026	10623.	7.607	-464.6	-458.4	18.63	12.09	23.36	1016
23	2.688	10666.	7.609	-463.5	-455.4	18.68	12.10	23.38	1018
24	10.320	11167.	7.633	-451.3	-420.1	19.20	12.22	23.53	1039
25	17.986	11606.	7.648	-439.1	-384.7	19.70	12.33	23.70	1059
26	25.658	12033.	7.656	-426.7	-349.1	20.18	12.43	23.86	1078
27	33.314	12460.	7.658	-414.2	-313.4	20.65	12.54	24.01	1095
28	40.959	12906.	7.656	-401.6	-277.7	21.11	12.64	24.12	1113
29	48.596	13341.	7.650	-388.9	-241.9	21.56	12.74	24.23	1129
30	56.244	13777.	7.642	-376.1	-206.0	21.99	12.83	24.31	1145
31	63.850	14214.	7.632	-363.3	-170.1	22.41	12.92	24.39	1161
32	71.461	14650.	7.620	-350.3	-134.2	22.83	13.01	24.46	1177
33	79.073	15097.	7.606	-337.2	-98.1	23.23	13.09	24.51	1192
34	86.685	15514.	7.592	-324.1	-61.9	23.62	13.17	24.58	1206
35	94.284	15946.	7.577	-310.9	-25.7	24.00	13.25	24.63	1220
36	101.859	16377.	7.560	-297.6	10.5	24.38	13.33	24.67	1234
37	109.413	16804.	7.544	-284.2	46.7	24.74	13.40	24.71	1248
38	116.966	17231.	7.527	-270.8	83.0	25.10	13.46	24.74	1262
39	124.485	17656.	7.509	-257.3	119.2	25.45	13.51	24.76	1275
40	131.989	18088.	7.491	-243.8	155.4	25.79	13.56	24.76	1289
42	146.932	18930.	7.455	-216.6	227.8	26.46	13.65	24.79	1314
44	161.814	19750.	7.419	-189.2	300.3	27.09	13.76	24.83	1338
46	176.607	20588.	7.382	-161.5	372.7	27.71	13.89	24.88	1362
48	191.327	21402.	7.345	-133.6	445.1	28.31	14.03	24.95	1383
50	205.990	22225.	7.309	-105.4	517.6	28.88	14.17	25.02	1404
55	242.275	24250.	7.217	-33.6	699.2	30.25	14.56	25.22	1453
60	278.119	26228.	7.127	40.7	881.9	31.54	14.93	25.42	1498
65	313.544	28152.	7.038	116.4	1064.8	32.76	15.39	25.72	1538
70	348.560	30127.	6.951	194.8	1249.1	33.92	15.96	26.10	1573

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0340 GMOLE/CM^3 ISOCHORE									
* 22.141	1.672	11658.	7.809	-481.5	-476.5	17.88	11.97	22.12	1041
23	8.364	12046.	7.835	-471.2	-446.2	18.34	12.08	22.35	1059
24	16.232	12498.	7.855	-459.0	-410.6	18.85	12.20	22.58	1078
25	24.118	12931.	7.868	-446.8	-374.9	19.35	12.31	22.80	1097
26	32.001	13351.	7.874	-434.4	-339.0	19.84	12.43	23.01	1115
27	39.870	13777.	7.875	-421.9	-303.1	20.31	12.54	23.19	1132
28	47.738	14221.	7.873	-409.3	-267.0	20.77	12.65	23.34	1149
29	55.592	14654.	7.867	-396.6	-230.9	21.21	12.75	23.48	1165
30	63.456	15084.	7.858	-383.8	-194.7	21.65	12.84	23.61	1180
31	71.282	15526.	7.848	-370.9	-158.5	22.07	12.94	23.72	1196
32	79.112	15963.	7.835	-357.9	-122.2	22.48	13.03	23.82	1211
33	86.947	16412.	7.822	-344.9	-85.8	22.88	13.12	23.90	1226
34	94.766	16824.	7.807	-331.7	-49.3	23.28	13.20	23.99	1240
35	102.582	17255.	7.792	-318.5	-12.8	23.66	13.28	24.07	1254
36	110.373	17689.	7.775	-305.2	23.8	24.04	13.35	24.14	1268
37	118.141	18118.	7.758	-291.8	60.3	24.40	13.42	24.20	1281
38	125.907	18544.	7.741	-278.3	96.9	24.76	13.49	24.25	1294
39	133.639	18972.	7.723	-264.8	133.5	25.11	13.54	24.29	1308
40	141.360	19407.	7.705	-251.2	170.0	25.46	13.59	24.31	1321
42	156.725	20254.	7.667	-224.0	243.1	26.12	13.69	24.37	1346
44	172.018	21076.	7.629	-196.5	316.2	26.76	13.80	24.45	1370
46	187.232	21921.	7.591	-168.7	389.2	27.38	13.92	24.52	1393
48	202.361	22741.	7.552	-140.7	462.3	27.97	14.07	24.62	1414
50	217.436	23570.	7.513	-112.5	535.5	28.55	14.22	24.71	1435
55	254.738	25612.	7.416	-40.4	718.7	29.92	14.60	24.96	1483
60	291.574	27600.	7.319	34.1	903.0	31.22	14.98	25.19	1527
65	327.965	29543.	7.222	110.1	1087.5	32.44	15.45	25.51	1566
0.0345 GMOLE/CM^3 ISOCHORE									
* 21.327	1.350	12756.	7.987	-498.5	-494.5	17.09	11.81	20.89	1065
22	6.732	13046.	8.016	-490.5	-470.8	17.46	11.91	21.13	1079
23	14.743	13477.	8.048	-478.5	-435.2	17.99	12.05	21.46	1098
24	22.830	13902.	8.070	-466.4	-399.4	18.51	12.18	21.75	1117
25	30.929	14325.	8.083	-454.2	-363.3	19.01	12.30	22.01	1135
26	39.021	14741.	8.090	-441.8	-327.2	19.49	12.42	22.25	1152
27	47.102	15165.	8.092	-429.3	-291.0	19.96	12.54	22.46	1169
28	55.191	15605.	8.089	-416.7	-254.7	20.42	12.65	22.65	1185
29	63.262	16037.	8.084	-404.0	-218.2	20.87	12.76	22.82	1201
30	71.339	16461.	8.075	-391.2	-181.7	21.30	12.86	22.97	1216
31	79.387	16908.	8.064	-378.3	-145.2	21.73	12.95	23.10	1231
32	87.436	17345.	8.052	-365.3	-108.5	22.14	13.05	23.23	1246
33	95.495	17791.	8.038	-352.2	-71.8	22.54	13.14	23.34	1260
34	103.520	18203.	8.023	-339.1	-35.0	22.93	13.22	23.46	1274
35	111.551	18632.	8.007	-325.8	1.8	23.32	13.30	23.55	1288
36	119.559	19067.	7.990	-312.5	38.7	23.69	13.38	23.64	1301
37	127.542	19497.	7.973	-299.0	75.5	24.06	13.45	23.72	1315
38	135.522	19923.	7.955	-285.6	112.5	24.42	13.52	23.79	1328
39	143.468	20352.	7.936	-272.0	149.3	24.77	13.57	23.85	1341
40	151.407	20789.	7.917	-258.4	186.3	25.12	13.62	23.89	1354
42	167.196	21640.	7.879	-231.1	260.0	25.79	13.72	23.98	1379
44	182.901	22465.	7.840	-203.5	333.7	26.43	13.83	24.08	1402
46	198.539	23317.	7.800	-175.7	407.4	27.05	13.96	24.18	1425
48	214.079	24149.	7.759	-147.6	481.1	27.64	14.11	24.30	1446
50	229.570	24974.	7.719	-119.3	555.0	28.22	14.26	24.41	1466
55	267.896	27028.	7.618	-47.0	739.8	29.60	14.65	24.70	1513
60	305.726	29019.	7.516	27.7	925.6	30.90	15.03	24.98	1557
65	343.095	30983.	7.415	104.0	1111.7	32.12	15.50	25.32	1595
0.0350 GMOLE/CM^3 ISOCHORE									
* 20.469	1.061	13821.	8.168	-515.6	-512.5	16.27	11.62	19.79	1088
21	5.378	14058.	8.195	-509.4	-493.8	16.57	11.71	20.01	1099
22	13.615	14504.	8.236	-497.6	-458.2	17.12	11.88	20.39	1119
23	21.851	14966.	8.266	-485.6	-422.4	17.65	12.03	20.71	1138
24	30.146	15375.	8.285	-473.6	-386.3	18.17	12.16	21.03	1156
25	38.454	15789.	8.298	-461.3	-350.0	18.66	12.29	21.31	1173
26	46.754	16204.	8.304	-449.0	-313.6	19.15	12.42	21.57	1189
27	55.047	16626.	8.306	-436.5	-277.1	19.62	12.54	21.80	1205
28	63.355	17061.	8.303	-423.9	-240.5	20.08	12.66	22.02	1221
29	71.641	17490.	8.298	-411.2	-203.8	20.52	12.77	22.21	1237
30	79.929	17909.	8.290	-398.4	-167.0	20.96	12.87	22.39	1251
31	88.201	18359.	8.279	-385.4	-130.1	21.38	12.97	22.54	1266
32	96.468	18794.	8.267	-372.4	-93.1	21.80	13.07	22.69	1281
33	104.749	19236.	8.254	-359.3	-56.1	22.20	13.16	22.82	1295
34	112.980	19650.	8.239	-346.1	-19.0	22.59	13.24	22.96	1308
35	121.225	20077.	8.223	-332.8	18.1	22.98	13.32	23.07	1322
36	129.451	20513.	8.206	-319.5	55.3	23.36	13.40	23.18	1335
37	137.649	20944.	8.188	-306.0	92.5	23.72	13.48	23.28	1348
38	145.842	21369.	8.170	-292.5	129.7	24.08	13.55	23.37	1361
39	154.003	21799.	8.151	-278.9	166.9	24.44	13.60	23.44	1374
40	162.160	22235.	8.132	-265.3	204.1	24.78	13.65	23.49	1387
42	178.376	23090.	8.093	-237.9	278.5	25.45	13.76	23.61	1411
44	194.494	23918.	8.052	-210.3	352.8	26.09	13.87	23.74	1434
46	210.559	24775.	8.010	-182.4	427.2	26.71	14.00	23.86	1457
48	226.513	25605.	7.968	-154.2	501.5	27.31	14.15	23.99	1477
50	242.420	26438.	7.925	-125.8	576.0	27.89	14.30	24.13	1497
55	281.775	28496.	7.816	-53.3	762.5	29.28	14.70	24.45	1544
60	320.600	30480.	7.706	21.7	949.8	30.58	15.09	24.76	1585

* TWO-PHASE BOUNDARY

TABLE X1. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0355 GMOLE/CM^3 ISOCHORE									
* 19.564	0.807	15050.	8.324	-532.7	-530.4	15.42	11.40	18.64	1112
20	4.452	15228.	8.354	-527.7	-515.0	15.67	11.49	18.85	1121
21	12.799	15636.	8.408	-516.1	-479.6	16.23	11.67	19.31	1140
22	21.250	16049.	8.448	-504.4	-443.7	16.78	11.85	19.71	1159
23	29.719	16515.	8.477	-492.4	-407.6	17.31	12.00	20.05	1178
24	38.217	16918.	8.497	-480.4	-371.3	17.82	12.15	20.38	1194
25	46.730	17324.	8.510	-468.2	-334.8	18.32	12.28	20.69	1211
26	55.237	17738.	8.516	-455.8	-298.1	18.81	12.41	20.96	1227
27	63.741	18160.	8.518	-443.3	-261.4	19.28	12.54	21.21	1243
28	72.264	18588.	8.517	-430.7	-224.5	19.74	12.66	21.45	1258
29	80.764	19015.	8.512	-418.0	-187.5	20.18	12.78	21.66	1273
30	89.261	19430.	8.504	-405.2	-150.4	20.62	12.88	21.86	1287
31	97.758	19879.	8.494	-392.3	-113.2	21.04	12.98	22.03	1302
32	106.242	20312.	8.482	-379.2	-76.0	21.45	13.08	22.20	1316
33	114.742	20745.	8.469	-366.1	-38.6	21.86	13.17	22.35	1330
34	123.182	21167.	8.454	-352.9	-1.3	22.25	13.26	22.49	1343
35	131.640	21597.	8.438	-339.6	36.2	22.64	13.35	22.63	1356
36	140.083	22027.	8.421	-326.2	73.7	23.02	13.43	22.75	1369
37	148.497	22459.	8.403	-312.7	111.1	23.39	13.51	22.86	1382
38	156.901	22881.	8.385	-299.2	148.7	23.75	13.58	22.96	1395
39	165.278	23313.	8.366	-285.6	186.2	24.10	13.63	23.05	1407
40	173.653	23746.	8.346	-271.9	223.7	24.45	13.69	23.12	1420
42	190.296	24602.	8.306	-244.4	298.7	25.12	13.79	23.26	1444
44	206.829	25436.	8.264	-216.7	373.6	25.76	13.91	23.41	1467
46	223.324	26296.	8.221	-188.8	448.7	26.38	14.04	23.55	1489
48	239.694	27130.	8.176	-160.5	523.6	26.98	14.19	23.70	1509
50	256.018	27963.	8.132	-132.0	598.8	27.57	14.35	23.85	1529
55	296.400	30013.	8.018	-59.2	786.8	28.95	14.75	24.22	1574
60	336.212	31977.	7.901	16.0	975.6	30.26	15.14	24.56	1615
0.0360 GMOLE/CM^3 ISOCHORE									
* 18.612	0.590	16189.	8.490	-549.8	-548.1	14.52	11.13	17.61	1134
19	3.880	16358.	8.519	-545.4	-534.5	14.75	11.22	17.81	1142
20	12.456	16813.	8.580	-534.1	-499.0	15.33	11.44	18.29	1162
21	21.026	17283.	8.626	-522.6	-463.4	15.89	11.64	18.71	1182
22	29.678	17678.	8.662	-510.8	-427.3	16.44	11.82	19.12	1199
23	38.378	18131.	8.688	-498.9	-390.9	16.97	11.98	19.47	1217
24	47.076	18532.	8.706	-486.9	-354.4	17.48	12.13	19.81	1233
25	55.791	18933.	8.718	-474.7	-317.6	17.98	12.28	20.12	1249
26	64.505	19346.	8.725	-462.3	-280.8	18.46	12.41	20.41	1265
27	73.219	19766.	8.728	-449.8	-243.8	18.94	12.54	20.67	1280
28	81.954	20187.	8.727	-437.2	-206.6	19.39	12.66	20.92	1295
29	90.668	20613.	8.723	-424.5	-169.3	19.84	12.78	21.15	1309
30	99.371	21025.	8.716	-411.7	-132.0	20.28	12.89	21.36	1323
31	108.092	21469.	8.707	-398.7	-94.5	20.70	13.00	21.55	1338
32	116.791	21898.	8.696	-385.7	-57.0	21.11	13.10	21.74	1352
33	125.506	22322.	8.683	-372.5	-19.3	21.52	13.19	21.91	1365
34	134.159	22753.	8.669	-359.3	18.3	21.91	13.28	22.06	1378
35	142.829	23176.	8.654	-346.0	56.0	22.30	13.37	22.21	1391
36	151.489	23609.	8.637	-332.6	93.8	22.68	13.45	22.35	1404
37	160.119	24047.	8.619	-319.1	131.6	23.05	13.53	22.47	1417
38	168.734	24469.	8.601	-305.5	169.4	23.41	13.60	22.59	1429
39	177.327	24895.	8.582	-291.9	207.2	23.76	13.66	22.68	1441
40	185.917	25321.	8.562	-278.2	245.1	24.11	13.72	22.77	1453
42	202.988	26178.	8.520	-250.6	320.7	24.78	13.83	22.93	1477
44	219.941	27020.	8.476	-222.9	396.2	25.43	13.95	23.09	1500
46	236.865	27878.	8.431	-194.8	471.9	26.05	14.08	23.25	1521
48	253.653	28718.	8.384	-166.5	547.4	26.66	14.24	23.42	1541
50	270.393	29546.	8.336	-137.9	623.2	27.24	14.39	23.59	1560
55	311.795	31579.	8.212	-64.9	812.7	28.63	14.80	23.99	1604
0.0365 GMOLE/CM^3 ISOCHORE									
* 17.609	0.412	17459.	8.652	-566.7	-565.6	13.58	10.82	16.56	1159
18	3.784	17644.	8.681	-562.5	-552.0	13.82	10.92	16.77	1167
19	12.501	18136.	8.747	-551.4	-516.7	14.42	11.18	17.27	1187
20	21.285	18524.	8.799	-540.1	-481.1	15.00	11.40	17.76	1204
21	30.094	19000.	8.839	-528.6	-445.1	15.56	11.61	18.17	1223
22	38.942	19389.	8.871	-516.9	-408.8	16.10	11.79	18.58	1239
23	47.862	19817.	8.895	-505.1	-372.2	16.63	11.96	18.95	1256
24	56.761	20219.	8.913	-493.0	-335.5	17.14	12.12	19.29	1272
25	65.675	20615.	8.925	-480.8	-298.5	17.64	12.27	19.61	1287
26	74.596	21029.	8.933	-468.5	-261.4	18.12	12.40	19.91	1302
27	83.519	21447.	8.936	-456.0	-224.2	18.60	12.54	20.18	1317
28	92.463	21860.	8.936	-443.4	-186.7	19.05	12.67	20.45	1332
29	101.389	22283.	8.933	-430.7	-149.2	19.50	12.79	20.69	1346
30	110.298	22694.	8.927	-417.8	-111.7	19.94	12.90	20.91	1360
31	119.239	23130.	8.919	-404.9	-73.9	20.36	13.01	21.11	1374
32	128.152	23554.	8.909	-391.8	-36.1	20.77	13.11	21.31	1387
33	137.075	23968.	8.897	-378.7	1.9	21.18	13.21	21.50	1400
34	145.947	24411.	8.883	-365.4	39.7	21.58	13.30	21.66	1413
35	154.828	24832.	8.868	-352.1	77.7	21.96	13.39	21.82	1426
36	163.704	25262.	8.852	-338.6	115.8	22.34	13.48	21.97	1439
37	172.550	25693.	8.834	-325.1	153.9	22.71	13.56	22.11	1451
38	181.374	26111.	8.816	-311.5	192.0	23.07	13.63	22.23	1463
39	190.184	26545.	8.796	-297.9	230.1	23.43	13.69	22.34	1475
40	198.985	26963.	8.776	-284.1	268.3	23.78	13.75	22.44	1487
42	216.484	27818.	8.734	-256.5	344.4	24.45	13.86	22.62	1510
44	233.860	28670.	8.688	-228.7	420.5	25.10	13.99	22.80	1533
46	251.213	29523.	8.641	-200.5	496.8	25.72	14.13	22.97	1553
48	268.422	30369.	8.592	-172.1	573.0	26.33	14.28	23.16	1573
50	285.574	31187.	8.541	-143.4	649.3	26.92	14.44	23.34	1592
55	327.981	33176.	8.410	-70.2	840.3	28.31	14.86	23.78	1633

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0370 GMOLE/CM^3 ISOCHORE									
• 16.556	0.271	18951.	8.820	-583.5	-582.8	12.60	10.46	15.49	1188
17	4.207	19142.	8.850	-578.9	-567.3	12.88	10.59	15.74	1196
18	13.087	19571.	8.912	-568.1	-532.3	13.49	10.88	16.29	1213
19	22.027	19979.	8.965	-557.1	-496.8	14.09	11.14	16.79	1231
20	30.998	20342.	9.009	-545.8	-461.0	14.66	11.37	17.27	1246
21	40.038	20789.	9.045	-534.4	-424.7	15.22	11.58	17.69	1264
22	49.081	21179.	9.074	-522.7	-388.3	15.77	11.77	18.10	1279
23	58.207	21577.	9.098	-510.8	-351.4	16.29	11.95	18.47	1295
24	67.306	21978.	9.115	-498.8	-314.5	16.80	12.11	18.82	1310
25	76.418	22373.	9.128	-486.6	-277.4	17.30	12.26	19.15	1325
26	85.546	22786.	9.137	-474.3	-240.0	17.79	12.40	19.45	1340
27	94.679	23202.	9.142	-461.8	-202.6	18.26	12.53	19.73	1355
28	103.827	23609.	9.143	-449.2	-164.9	18.71	12.67	20.01	1369
29	112.964	24028.	9.141	-436.5	-127.1	19.16	12.79	20.26	1383
30	122.078	24440.	9.137	-423.7	-89.3	19.60	12.90	20.49	1397
31	131.234	24862.	9.130	-410.7	-51.3	20.02	13.02	20.71	1410
32	140.357	25279.	9.121	-397.6	-13.3	20.44	13.12	20.92	1423
33	149.485	25686.	9.110	-384.4	24.9	20.84	13.22	21.12	1436
34	158.582	26139.	9.097	-371.2	63.1	21.24	13.32	21.29	1449
35	167.673	26560.	9.082	-357.8	101.4	21.63	13.41	21.46	1461
36	176.762	26984.	9.066	-344.3	139.7	22.00	13.50	21.62	1474
37	185.824	27415.	9.049	-330.8	178.1	22.38	13.58	21.76	1486
38	194.857	27830.	9.031	-317.2	216.4	22.74	13.66	21.90	1498
39	203.884	28264.	9.011	-303.5	254.8	23.09	13.72	22.01	1510
40	212.891	28672.	8.990	-289.7	293.3	23.44	13.78	22.13	1521
42	230.817	29524.	8.946	-262.1	370.0	24.12	13.90	22.33	1544
44	248.622	30387.	8.899	-234.1	446.7	24.77	14.03	22.51	1566
46	266.399	31229.	8.850	-205.9	523.6	25.40	14.17	22.71	1586
48	284.032	32081.	8.798	-177.4	600.4	26.00	14.33	22.90	1605
50	301.590	32886.	8.744	-148.6	677.3	26.59	14.49	23.10	1623
55	344.977	34809.	8.603	-75.1	869.6	27.99	14.92	23.57	1663
0.0375 GMOLE/CM^3 ISOCHORE									
• 15.451	0.165	20739.	9.036	-600.1	-599.6	11.56	10.06	14.45	1223
16	5.209	20881.	9.054	-594.5	-580.4	11.92	10.25	14.77	1230
17	14.275	21139.	9.092	-584.1	-545.5	12.55	10.56	15.35	1243
18	23.360	21525.	9.132	-573.4	-510.3	13.16	10.85	15.87	1258
19	32.491	21889.	9.171	-562.4	-474.6	13.75	11.11	16.37	1273
20	41.642	22250.	9.208	-551.2	-438.7	14.33	11.34	16.83	1288
21	50.895	22652.	9.240	-539.7	-402.2	14.89	11.55	17.26	1304
22	60.134	23044.	9.268	-528.1	-365.6	15.43	11.75	17.66	1319
23	69.451	23414.	9.292	-516.2	-328.6	15.96	11.93	18.04	1334
24	78.751	23814.	9.311	-504.2	-291.4	16.47	12.09	18.39	1349
25	88.060	24208.	9.325	-492.0	-254.1	16.97	12.25	18.72	1364
26	97.394	24618.	9.336	-479.7	-216.6	17.45	12.39	19.02	1378
27	106.734	25038.	9.343	-467.3	-178.9	17.92	12.53	19.32	1393
28	116.084	25438.	9.347	-454.7	-141.0	18.38	12.67	19.60	1406
29	125.429	25848.	9.348	-441.9	-103.0	18.82	12.79	19.86	1420
30	134.750	26267.	9.345	-429.1	-65.0	19.26	12.91	20.10	1433
31	144.113	26668.	9.340	-416.1	-26.7	19.68	13.02	20.33	1446
32	153.443	27078.	9.332	-403.0	11.6	20.10	13.14	20.55	1459
33	162.774	27482.	9.323	-389.8	50.0	20.51	13.24	20.76	1472
34	172.098	27940.	9.311	-376.6	88.4	20.90	13.34	20.94	1485
35	181.400	28360.	9.297	-363.2	127.0	21.29	13.43	21.12	1497
36	190.700	28779.	9.281	-349.7	165.6	21.67	13.52	21.29	1509
37	199.977	29206.	9.264	-336.1	204.2	22.04	13.61	21.44	1521
38	209.216	29619.	9.245	-322.5	242.8	22.41	13.69	21.59	1532
39	218.460	30053.	9.225	-308.8	281.5	22.76	13.75	21.71	1544
40	227.669	30453.	9.204	-295.0	320.2	23.11	13.81	21.83	1555
42	246.020	31300.	9.158	-267.2	397.5	23.79	13.93	22.04	1578
44	264.259	32172.	9.108	-239.2	474.8	24.44	14.07	22.24	1599
46	282.452	32995.	9.055	-210.9	552.2	25.07	14.21	22.45	1618
48	300.514	33856.	8.999	-182.4	629.6	25.68	14.38	22.65	1637
50	318.469	34641.	8.940	-153.4	707.1	26.27	14.54	22.86	1654

• TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3 ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0380 GMCLE/CM^3 ISOCHORE									
* 14.295	0.092	22443.	9.324	-616.3	-616.1	10.47	9.66	13.55	1258
15	6.734	22613.	9.297	-609.4	-591.5	10.94	9.91	13.93	1264
16	16.138	22855.	9.290	-599.3	-556.3	11.59	10.24	14.48	1275
17	25.354	23185.	9.305	-588.9	-521.3	12.22	10.54	15.00	1288
18	34.619	23517.	9.332	-578.3	-486.0	12.83	10.83	15.50	1301
19	43.927	23865.	9.363	-567.3	-450.2	13.42	11.08	15.98	1315
20	53.261	24235.	9.396	-556.1	-414.1	14.00	11.32	16.43	1330
21	62.703	24591.	9.427	-544.7	-377.5	14.56	11.53	16.86	1344
22	72.138	24984.	9.456	-533.0	-340.7	15.10	11.73	17.25	1359
23	81.635	25332.	9.481	-521.2	-303.5	15.62	11.91	17.64	1373
24	91.133	25728.	9.502	-509.2	-266.2	16.13	12.08	17.99	1388
25	100.639	26127.	9.520	-497.1	-228.7	16.63	12.23	18.32	1402
26	110.177	26527.	9.533	-484.8	-191.0	17.11	12.38	18.63	1416
27	119.724	26938.	9.543	-472.3	-153.1	17.58	12.52	18.93	1430
28	129.273	27334.	9.549	-459.7	-115.0	18.04	12.66	19.22	1444
29	138.824	27745.	9.552	-447.0	-76.8	18.49	12.79	19.49	1457
30	148.353	28160.	9.552	-434.1	-38.6	18.92	12.91	19.73	1471
31	157.915	28550.	9.548	-421.2	-0.1	19.35	13.03	19.98	1483
32	167.448	28954.	9.542	-408.1	38.4	19.76	13.15	20.21	1496
33	176.980	29358.	9.534	-394.9	77.0	20.17	13.25	20.42	1508
34	186.534	29814.	9.523	-381.6	115.8	20.57	13.35	20.61	1521
35	196.045	30235.	9.509	-368.2	154.6	20.96	13.45	20.79	1533
36	205.553	30646.	9.494	-354.7	193.4	21.34	13.54	20.97	1544
37	215.043	31070.	9.477	-341.1	232.3	21.71	13.63	21.14	1556
38	224.488	31482.	9.459	-327.4	271.2	22.07	13.71	21.29	1567
39	233.949	31914.	9.438	-313.7	310.1	22.43	13.78	21.42	1579
40	243.357	32310.	9.416	-299.9	349.0	22.78	13.84	21.55	1590
42	262.130	33151.	9.369	-272.0	426.9	23.46	13.97	21.77	1611
44	280.806	34027.	9.317	-244.0	504.8	24.11	14.11	21.98	1632
46	299.403	34820.	9.260	-215.6	582.8	24.74	14.26	22.21	1651
48	317.898	35691.	9.201	-186.9	660.8	25.35	14.43	22.42	1669
50	336.239	36448.	9.138	-157.9	738.7	25.95	14.60	22.64	1685
0.0385 GMCLE/CM^3 ISOCHORE									
* 14.155	10.556	24648.	9.445	-622.1	-594.3	10.05	9.64	13.14	1300
15	18.577	24780.	9.424	-613.8	-564.9	10.62	9.91	13.59	1307
16	28.081	24936.	9.431	-603.8	-529.9	11.27	10.23	14.13	1316
17	37.468	25279.	9.457	-593.4	-494.8	11.90	10.53	14.64	1329
18	46.885	25554.	9.494	-582.7	-459.3	12.51	10.80	15.14	1342
19	56.368	25909.	9.533	-571.8	-423.4	13.10	11.06	15.62	1356
20	65.888	26284.	9.572	-560.6	-387.2	13.67	11.29	16.06	1371
21	75.499	26607.	9.609	-549.2	-350.5	14.23	11.51	16.49	1384
22	85.130	26996.	9.642	-537.6	-313.6	14.77	11.71	16.89	1399
23	94.797	27333.	9.671	-525.8	-276.3	15.29	11.89	17.27	1413
24	104.492	27722.	9.696	-513.8	-238.8	15.80	12.06	17.62	1427
25	114.195	28115.	9.716	-501.7	-201.1	16.30	12.22	17.96	1441
26	123.934	28514.	9.732	-489.4	-163.2	16.78	12.37	18.27	1455
27	133.685	28921.	9.744	-476.9	-125.1	17.25	12.52	18.58	1469
28	143.431	29319.	9.752	-464.4	-86.9	17.71	12.66	18.87	1482
29	153.187	29718.	9.756	-451.6	-48.5	18.15	12.79	19.14	1495
30	162.924	30134.	9.757	-438.8	-10.0	18.59	12.91	19.39	1508
31	172.677	30511.	9.755	-425.8	28.7	19.01	13.04	19.64	1520
32	182.410	30910.	9.749	-412.7	67.4	19.43	13.15	19.88	1532
33	192.147	31321.	9.741	-399.5	106.2	19.84	13.26	20.10	1544
34	201.925	31763.	9.731	-386.2	145.2	20.23	13.37	20.29	1557
35	211.647	32184.	9.718	-372.8	184.2	20.62	13.47	20.49	1569
36	221.359	32589.	9.703	-359.3	223.3	21.00	13.56	20.67	1580
37	231.059	33008.	9.686	-345.6	262.5	21.38	13.65	20.84	1591
38	240.711	33420.	9.667	-331.9	301.6	21.74	13.74	21.00	1602
39	250.386	33848.	9.647	-318.2	340.8	22.10	13.81	21.14	1614
40	259.993	34250.	9.625	-304.3	379.9	22.45	13.87	21.27	1624
42	279.185	35085.	9.577	-276.5	458.3	23.13	14.01	21.51	1646
44	298.297	35951.	9.523	-248.3	536.8	23.79	14.15	21.74	1666
46	317.282	36703.	9.466	-219.8	615.2	24.42	14.31	21.98	1684
48	336.214	37585.	9.405	-191.0	693.8	25.03	14.48	22.20	1702

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0390 GMOLE/CM^3 ISOCHORE									
* 14.759	29.213	27057.	9.499	-620.2	-544.3	10.14	9.84	13.12	1346
15	31.533	27067.	9.504	-617.8	-535.9	10.30	9.91	13.24	1348
16	41.092	27127.	9.539	-607.7	-501.0	10.95	10.21	13.79	1357
17	50.640	27416.	9.587	-597.4	-465.8	11.58	10.50	14.30	1370
18	60.185	27657.	9.639	-586.7	-430.4	12.18	10.78	14.80	1382
19	69.848	28023.	9.691	-575.8	-394.4	12.77	11.03	15.27	1396
20	79.557	28396.	9.741	-564.7	-358.0	13.35	11.26	15.72	1411
21	89.323	28702.	9.786	-553.3	-321.2	13.90	11.48	16.15	1424
22	99.146	29081.	9.826	-541.7	-284.1	14.44	11.68	16.55	1439
23	108.982	29418.	9.860	-529.9	-246.8	14.96	11.87	16.93	1452
24	118.869	29799.	9.889	-518.0	-209.2	15.47	12.04	17.29	1466
25	128.768	30190.	9.912	-505.9	-171.3	15.97	12.20	17.62	1480
26	138.704	30580.	9.931	-493.6	-133.2	16.45	12.36	17.94	1494
27	148.657	30980.	9.945	-481.2	-94.9	16.92	12.51	18.25	1507
28	158.599	31371.	9.954	-468.6	-56.5	17.37	12.65	18.54	1520
29	168.556	31769.	9.959	-455.8	-17.9	17.82	12.79	18.82	1533
30	178.502	32188.	9.961	-443.0	20.8	18.26	12.91	19.08	1546
31	188.439	32553.	9.959	-430.0	59.6	18.68	13.04	19.33	1557
32	198.372	32951.	9.954	-416.9	98.5	19.10	13.16	19.57	1569
33	208.315	33370.	9.947	-403.7	137.5	19.50	13.27	19.79	1581
34	218.309	33789.	9.936	-390.4	176.8	19.90	13.38	20.00	1593
35	228.242	34210.	9.923	-376.9	216.0	20.29	13.48	20.19	1605
36	238.155	34610.	9.908	-363.4	255.3	20.67	13.58	20.38	1616
37	248.063	35023.	9.891	-349.8	294.7	21.05	13.68	20.56	1627
38	257.921	35436.	9.871	-336.1	334.0	21.41	13.76	20.72	1638
39	267.809	35857.	9.850	-322.3	373.5	21.77	13.84	20.87	1649
40	277.623	36284.	9.828	-308.4	412.9	22.12	13.91	21.00	1659
42	297.230	37117.	9.778	-280.4	491.8	22.80	14.04	21.25	1680
44	316.768	37946.	9.724	-252.2	570.8	23.46	14.19	21.49	1700
46	336.115	38641.	9.665	-223.6	649.6	24.10	14.35	21.76	1716
0.0395 GMOLE/CM^3 ISOCHORE									
* 15.378	49.224	29331.	9.564	-617.5	-491.2	10.23	10.00	13.11	1391
16	55.227	29437.	9.618	-611.2	-469.5	10.63	10.18	13.44	1398
17	64.891	29594.	9.702	-600.9	-434.4	11.26	10.47	13.98	1409
18	74.555	29835.	9.780	-590.3	-399.0	11.86	10.74	14.49	1422
19	84.403	30207.	9.849	-579.4	-362.9	12.45	10.99	14.96	1437
20	94.294	30564.	9.911	-568.3	-326.4	13.02	11.23	15.40	1452
21	104.214	30876.	9.964	-556.9	-289.6	13.58	11.45	15.83	1465
22	114.223	31239.	10.010	-545.4	-252.4	14.11	11.65	16.24	1479
23	124.230	31588.	10.048	-533.6	-215.0	14.64	11.84	16.62	1493
24	134.305	31960.	10.080	-521.7	-177.2	15.14	12.02	16.97	1506
25	144.399	32347.	10.106	-509.6	-139.2	15.64	12.18	17.31	1520
26	154.527	32724.	10.126	-497.3	-100.9	16.12	12.34	17.63	1533
27	164.678	33117.	10.141	-484.9	-62.5	16.59	12.50	17.94	1546
28	174.815	33509.	10.151	-472.3	-23.9	17.04	12.65	18.24	1558
29	184.970	33906.	10.157	-459.6	14.8	17.49	12.79	18.52	1571
30	195.124	34316.	10.160	-446.8	53.7	17.93	12.91	18.77	1583
31	205.244	34681.	10.159	-433.8	92.7	18.35	13.04	19.03	1595
32	215.376	35086.	10.155	-420.7	131.8	18.77	13.17	19.27	1607
33	225.531	35506.	10.148	-407.5	171.1	19.17	13.28	19.50	1619
34	235.727	35895.	10.138	-394.1	210.5	19.57	13.39	19.71	1630
35	245.870	36313.	10.127	-380.7	250.0	19.96	13.50	19.92	1641
36	255.982	36712.	10.113	-367.1	289.5	20.34	13.60	20.11	1652
37	266.095	37118.	10.097	-353.5	329.1	20.72	13.70	20.30	1663
38	276.161	37535.	10.080	-339.7	368.7	21.08	13.79	20.47	1673
39	286.256	37944.	10.060	-325.9	408.4	21.44	13.86	20.62	1684
40	296.295	38426.	10.040	-312.0	448.0	21.80	13.94	20.75	1696
42	316.316	39250.	9.995	-284.0	527.4	22.48	14.08	21.02	1716
44	336.255	40014.	9.945	-255.7	606.9	23.14	14.23	21.29	1735
0.0400 GMOLE/CM^3 ISOCHORE									
* 16.013	70.628	31515.	9.667	-614.0	-435.1	10.33	10.12	13.13	1433
17	80.240	31809.	9.801	-603.9	-400.6	10.95	10.41	13.66	1448
18	90.036	32107.	9.912	-593.3	-365.2	11.55	10.69	14.18	1463
19	100.067	32463.	10.004	-582.5	-329.0	12.13	10.95	14.66	1478
20	110.131	32794.	10.081	-571.4	-292.4	12.70	11.19	15.11	1492
21	120.212	33130.	10.143	-560.1	-255.6	13.25	11.41	15.54	1506
22	130.397	33471.	10.195	-548.6	-218.3	13.79	11.62	15.95	1519
23	140.583	33841.	10.237	-536.9	-180.8	14.31	11.81	16.33	1533
24	150.843	34204.	10.271	-525.0	-142.9	14.82	12.00	16.68	1546
25	161.129	34585.	10.297	-512.9	-104.7	15.31	12.17	17.02	1559
26	171.442	34957.	10.318	-500.6	-66.4	15.79	12.33	17.34	1572
27	181.787	35333.	10.333	-488.2	-27.7	16.26	12.48	17.65	1585
28	192.120	35726.	10.344	-475.7	11.0	16.72	12.64	17.95	1597
29	202.468	36109.	10.351	-463.0	49.9	17.16	12.78	18.23	1609
30	212.830	36518.	10.354	-450.1	89.0	17.60	12.91	18.49	1621
31	223.135	36896.	10.354	-437.1	128.1	18.02	13.04	18.75	1633
32	233.467	37300.	10.352	-424.0	167.4	18.44	13.17	18.99	1644
33	243.835	37727.	10.347	-410.8	206.9	18.85	13.29	19.22	1656
34	254.218	38083.	10.339	-397.4	246.5	19.24	13.40	19.45	1667
35	264.569	38496.	10.330	-384.0	286.2	19.63	13.51	19.66	1678
36	274.882	38907.	10.319	-370.4	325.9	20.02	13.62	19.86	1689
37	285.196	39306.	10.307	-356.8	365.7	20.39	13.72	20.05	1699
38	295.471	39721.	10.293	-343.0	405.5	20.76	13.81	20.23	1710
39	305.766	40112.	10.278	-329.1	445.4	21.12	13.89	20.39	1721
40	316.070	40695.	10.262	-315.2	485.4	21.47	13.96	20.51	1734
42	336.503	41521.	10.226	-287.2	565.2	22.15	14.11	20.81	1754

* TWO-PHASE BOUNDARY

TABLE X1. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE $CM^3ATM/GMOLE$	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_V, HEAT CAPACITY J/GMOLE-K	C_P, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0405 GMOLE/CM^3 ISOCHORE									
* 16.664	93.457	33912.	9.835	-609.8	-376.0	10.43	10.23	13.17	1481
17	96.705	34057.	9.894	-606.3	-364.4	10.64	10.33	13.35	1487
18	106.680	34491.	10.044	-595.8	-329.0	11.24	10.62	13.88	1505
19	116.878	34793.	10.161	-585.1	-292.7	11.82	10.89	14.38	1519
20	127.100	35098.	10.252	-574.1	-256.1	12.38	11.14	14.84	1533
21	137.357	35463.	10.323	-562.8	-219.2	12.93	11.37	15.27	1547
22	147.707	35782.	10.379	-551.3	-181.8	13.47	11.59	15.68	1560
23	158.084	36176.	10.423	-539.6	-144.1	13.99	11.79	16.05	1574
24	168.523	36532.	10.458	-527.8	-106.1	14.49	11.97	16.41	1586
25	178.998	36904.	10.485	-515.7	-67.9	14.98	12.15	16.75	1599
26	189.490	37255.	10.505	-503.5	-29.4	15.46	12.31	17.07	1611
27	200.024	37628.	10.521	-491.1	9.4	15.93	12.47	17.38	1623
28	210.554	38023.	10.532	-478.5	48.3	16.39	12.63	17.68	1635
29	221.092	38398.	10.540	-465.8	87.3	16.83	12.78	17.96	1647
30	231.655	38793.	10.544	-453.0	126.6	17.27	12.91	18.22	1659
31	242.154	39195.	10.547	-440.0	165.8	17.70	13.04	18.48	1671
32	252.690	39605.	10.547	-426.9	205.3	18.11	13.17	18.73	1682
33	263.265	40010.	10.545	-413.6	245.0	18.52	13.29	18.96	1694
34	273.824	40357.	10.542	-400.3	284.8	18.92	13.41	19.19	1704
35	284.380	40761.	10.538	-386.8	324.6	19.31	13.52	19.41	1715
36	294.899	41185.	10.532	-373.3	364.5	19.69	13.63	19.62	1726
37	305.411	41576.	10.525	-359.6	404.5	20.07	13.73	19.82	1737
38	315.897	42002.	10.518	-345.8	444.5	20.43	13.82	20.00	1748
39	326.382	42365.	10.510	-331.9	484.6	20.79	13.90	20.18	1758
40	337.016	43117.	10.501	-318.0	525.2	21.15	13.98	20.30	1774
0.0410 GMOLE/CM^3 ISOCHORE									
* 17.333	117.890	36883.	10.066	-604.8	-313.5	10.53	10.35	13.22	1539
18	124.549	37009.	10.171	-597.9	-290.1	10.93	10.55	13.58	1548
19	134.872	37197.	10.299	-587.2	-253.9	11.51	10.83	14.10	1560
20	145.244	37494.	10.402	-576.2	-217.3	12.07	11.09	14.57	1573
21	155.688	37876.	10.483	-565.0	-180.2	12.62	11.33	15.00	1588
22	166.193	38176.	10.548	-553.6	-142.8	13.15	11.55	15.42	1600
23	176.772	38590.	10.599	-541.9	-105.0	13.67	11.76	15.79	1614
24	187.388	38941.	10.640	-530.1	-67.0	14.17	11.95	16.16	1627
25	198.046	39307.	10.672	-518.0	-28.6	14.66	12.13	16.49	1639
26	208.711	39647.	10.696	-505.8	10.0	15.14	12.30	16.82	1651
27	219.429	40003.	10.715	-493.4	48.9	15.61	12.46	17.13	1663
28	230.156	40398.	10.728	-480.9	87.9	16.06	12.62	17.43	1674
29	240.879	40765.	10.737	-468.2	127.1	16.51	12.77	17.71	1686
30	251.635	41140.	10.742	-455.3	166.5	16.95	12.91	17.98	1697
31	262.343	41570.	10.745	-442.4	206.0	17.37	13.04	18.23	1709
32	273.084	41981.	10.744	-429.3	245.6	17.79	13.17	18.48	1720
33	283.854	42354.	10.742	-416.0	285.5	18.19	13.30	18.72	1731
34	294.590	42721.	10.737	-402.7	325.4	18.59	13.41	18.94	1741
35	305.344	43110.	10.730	-389.2	365.4	18.98	13.53	19.16	1752
36	316.084	43571.	10.722	-375.6	405.5	19.37	13.63	19.36	1763
37	326.789	43956.	10.713	-361.9	445.7	19.74	13.74	19.56	1774
38	337.490	44387.	10.703	-348.1	485.9	20.11	13.83	19.74	1784
39	348.147	44710.	10.691	-334.3	526.1	20.47	13.91	19.92	1794
0.0415 GMOLE/CM^3 ISOCHORE									
* 18.020	143.963	39353.	10.283	-599.2	-247.7	10.64	10.47	13.31	1586
19	154.088	39678.	10.438	-588.7	-212.5	11.20	10.76	13.83	1601
20	164.614	40010.	10.559	-577.8	-175.9	11.76	11.03	14.31	1615
21	175.246	40366.	10.651	-566.7	-138.8	12.30	11.28	14.75	1629
22	185.898	40659.	10.722	-555.3	-101.4	12.83	11.51	15.17	1641
23	196.686	41077.	10.777	-543.7	-63.4	13.35	11.73	15.55	1655
24	207.477	41426.	10.820	-531.8	-25.3	13.85	11.92	15.91	1667
25	218.312	41774.	10.852	-519.8	13.2	14.34	12.11	16.25	1679
26	229.146	42110.	10.878	-507.6	51.8	14.82	12.28	16.58	1690
27	240.041	42459.	10.897	-495.3	90.8	15.29	12.45	16.89	1702
28	250.965	42851.	10.912	-482.7	130.0	15.74	12.61	17.19	1713
29	261.870	43217.	10.923	-470.0	169.3	16.19	12.76	17.47	1724
30	272.806	43556.	10.931	-457.2	208.9	16.62	12.90	17.75	1735
31	283.734	44003.	10.937	-444.2	248.5	17.05	13.04	18.00	1747
32	294.678	44399.	10.942	-431.1	288.3	17.46	13.17	18.25	1758
33	305.626	44740.	10.944	-417.9	328.3	17.87	13.30	18.50	1768
34	316.560	45177.	10.946	-404.5	368.4	18.27	13.42	18.72	1780
35	327.505	45547.	10.946	-391.1	408.6	18.66	13.53	18.95	1790
36	338.489	46071.	10.946	-377.5	449.0	19.04	13.64	19.15	1803
37	349.386	46453.	10.946	-363.8	489.3	19.42	13.74	19.36	1813

* TWO-PHASE BOUNDARY

TABLE XI. THERMODYNAMIC PROPERTIES OF PARAHYDROGEN, ISOCHORES-CONTINUED

TEMPERATURE DEG. KELVIN	PRESSURE ATM	$(\partial P/\partial \rho)_T$ ISOTHERM DERIVATIVE CM^3ATM/GMOLE	$(\partial P/\partial T)_\rho$ ISOCHORE DERIVATIVE ATM/K	INTERNAL ENERGY J/GMOLE	ENTHALPY J/GMOLE	ENTROPY J/GMOLE-K	C_v, HEAT CAPACITY J/GMOLE-K	C_p, HEAT CAPACITY J/GMOLE-K	VELOCITY OF SOUND METER/SEC
0.0420 GMOLE/CM^3 ISOCHORE									
* 18.726	171.685	42117.	10.580	-592.7	-178.5	10.74	10.60	13.46	1639
19	174.564	42239.	10.618	-589.8	-168.7	10.89	10.68	13.60	1644
20	185.280	42685.	10.737	-579.0	-132.0	11.45	10.97	14.07	1659
21	196.067	42931.	10.827	-567.9	-94.8	11.99	11.23	14.53	1670
22	206.869	43240.	10.896	-556.5	-57.4	12.52	11.47	14.94	1682
23	217.860	43631.	10.949	-544.9	-19.3	13.03	11.69	15.32	1695
24	228.826	43978.	10.991	-533.1	18.9	13.53	11.90	15.68	1707
25	239.831	44314.	11.024	-521.1	57.5	14.02	12.09	16.02	1718
26	250.835	44658.	11.051	-508.9	96.2	14.50	12.26	16.35	1730
27	261.901	44995.	11.073	-496.6	135.2	14.97	12.43	16.66	1741
28	273.019	45378.	11.092	-484.1	174.6	15.42	12.60	16.96	1752
29	284.103	45733.	11.107	-471.4	214.0	15.87	12.75	17.25	1763
30	295.203	46041.	11.121	-458.6	253.6	16.30	12.89	17.52	1773
31	306.349	46458.	11.133	-445.6	293.5	16.73	13.03	17.78	1785
32	317.481	46804.	11.144	-432.5	333.4	17.14	13.17	18.04	1795
33	328.599	47156.	11.154	-419.3	373.5	17.55	13.29	18.29	1806
34	339.783	47727.	11.164	-405.9	413.8	17.95	13.41	18.51	1820
0.0425 GMOLE/CM^3 ISOCHORE									
* 19.453	201.273	45562.	10.889	-585.5	-105.6	10.84	10.77	13.61	1701
20	207.333	45565.	10.928	-579.5	-85.2	11.14	10.92	13.86	1705
21	218.189	45570.	10.995	-568.5	-48.3	11.68	11.19	14.32	1712
22	229.157	45930.	11.056	-557.2	-10.8	12.21	11.44	14.72	1724
23	240.327	46243.	11.110	-545.6	27.4	12.72	11.66	15.11	1735
24	251.465	46586.	11.156	-533.8	65.7	13.22	11.87	15.47	1747
25	262.636	46914.	11.195	-521.9	104.3	13.71	12.06	15.81	1758
26	273.817	47285.	11.227	-509.7	143.1	14.19	12.24	16.13	1769
27	285.050	47613.	11.251	-497.4	182.2	14.65	12.42	16.45	1780
28	296.354	47974.	11.269	-484.9	221.7	15.11	12.59	16.74	1791
29	307.616	48328.	11.281	-472.2	261.2	15.55	12.74	17.03	1802
30	318.859	48596.	11.287	-459.4	300.8	15.98	12.89	17.30	1811
31	330.186	48877.	11.287	-446.4	340.8	16.41	13.03	17.56	1820
32	341.465	49104.	11.283	-433.4	380.7	16.82	13.17	17.82	1828
0.0430 GMOLE/CM^3 ISOCHORE									
* 20.201	232.634	47909.	11.281	-577.4	-29.3	10.94	10.99	13.93	1747
21	241.648	48279.	11.234	-568.6	0.8	11.37	11.18	14.19	1755
22	252.819	48747.	11.234	-557.3	38.5	11.90	11.41	14.53	1766
23	264.111	48903.	11.270	-545.8	76.6	12.41	11.63	14.90	1775
24	275.418	49237.	11.320	-534.0	115.0	12.91	11.84	15.26	1786
25	286.753	49561.	11.370	-522.1	153.6	13.40	12.03	15.61	1797
26	298.132	49987.	11.409	-510.0	192.6	13.87	12.22	15.93	1810
27	309.527	50311.	11.433	-497.6	231.7	14.34	12.41	16.25	1820
28	321.004	50639.	11.436	-485.1	271.3	14.79	12.58	16.55	1829
29	332.443	50993.	11.417	-472.5	310.9	15.24	12.75	16.81	1838
30	343.810	51221.	11.375	-459.6	350.5	15.67	12.91	17.06	1845

* TWO-PHASE BOUNDARY

TABLE XII. EXPERIMENTAL VS. CALCULATED C_v

EXPERIMENTAL VALUES, FROM REFERENCE 7				CALCULATED VALUES, THIS PAPER		
PRESSURE ATM	TEMPERATURE DEG. K	DENSITY GMOLE/CM^3	C_v J/GMOLE-K	C_v J/GMOLE-K	DIFFERENCE J/GMOLE-K	PERCENT DEVIATION
13.25	33.497	0.01095	17.56	17.37	0.19	1.07
14.77	34.695	0.01095	16.07	16.09	-0.02	-0.13
16.87	36.367	0.01095	15.09	15.07	0.03	0.17
19.10	38.150	0.01095	14.52	14.48	0.05	0.32
21.52	40.105	0.01095	14.14	14.09	0.05	0.36
24.26	42.325	0.01095	13.88	13.81	0.08	0.54
26.98	44.538	0.01095	13.69	13.65	0.05	0.34
29.54	46.624	0.01095	13.61	13.57	0.04	0.28
31.98	48.607	0.01095	13.56	13.54	0.02	0.15
34.36	50.555	0.01095	13.57	13.54	0.03	0.22
45.59	59.757	0.01094	13.74	13.80	-0.06	-0.43
58.31	70.241	0.01094	14.68	14.62	0.06	0.40
14.72	34.216	0.01330	17.67	17.52	0.15	0.88
18.19	36.402	0.01330	15.27	15.22	0.05	0.30
21.33	38.384	0.01329	14.56	14.56	-0.01	-0.06
24.22	40.214	0.01329	14.15	14.18	-0.03	-0.18
27.22	42.107	0.01329	13.92	13.92	0.00	0.03
30.19	43.985	0.01329	13.77	13.75	0.02	0.12
33.28	45.940	0.01329	13.68	13.65	0.03	0.18
36.53	47.994	0.01329	13.61	13.60	0.01	0.09
39.79	50.057	0.01329	13.60	13.59	0.01	0.09
55.25	59.868	0.01328	13.88	13.87	0.02	0.12
71.10	69.974	0.01328	14.68	14.67	0.01	0.06
87.02	80.206	0.01327	16.03	16.01	0.02	0.10
102.25	90.055	0.01327	17.57	17.64	-0.07	-0.38
14.56	33.889	0.01619	18.64	17.87	0.77	4.15
18.88	36.035	0.01619	15.20	15.05	0.16	1.05
23.29	38.194	0.01619	14.38	14.38	0.	0.
31.65	42.244	0.01619	13.81	13.83	-0.03	-0.18
35.80	44.245	0.01619	13.69	13.69	0.	0.
39.79	46.166	0.01618	13.63	13.61	0.02	0.15
47.73	49.986	0.01618	13.61	13.59	0.01	0.09
68.32	59.894	0.01617	13.92	13.93	-0.01	-0.09
89.06	69.931	0.01616	14.83	14.77	0.07	0.45
109.81	80.052	0.01616	16.10	16.11	-0.01	-0.08
129.91	89.943	0.01615	17.70	17.75	-0.05	-0.28
13.61	33.316	0.01869	17.36	16.51	0.84	4.85
16.29	34.425	0.01869	15.47	15.38	0.09	0.59
20.72	36.217	0.01869	14.46	14.39	0.07	0.49
25.61	38.159	0.01869	14.01	14.01	-0.00	-0.03
30.39	40.040	0.01869	13.78	13.81	-0.03	-0.21
35.33	41.969	0.01869	13.66	13.66	0.00	0.03
40.60	44.018	0.01868	13.56	13.56	0.00	0.03
46.06	46.142	0.01868	13.55	13.53	0.02	0.15
51.47	48.238	0.01868	13.54	13.54	0.	0.
56.67	50.249	0.01868	13.56	13.58	-0.02	-0.12
82.68	60.335	0.01867	14.01	14.03	-0.02	-0.12
105.93	69.404	0.01866	14.81	14.81	0.00	0.03
132.61	79.924	0.01865	16.18	16.20	-0.02	-0.13
156.25	89.331	0.01864	17.59	17.76	-0.17	-0.95
16.97	33.696	0.02292	13.81	13.61	0.20	1.45
24.85	35.943	0.02292	13.51	13.49	0.02	0.15
39.40	40.010	0.02291	13.38	13.38	0.00	0.03
46.37	41.943	0.02291	13.38	13.36	0.03	0.19
53.43	43.900	0.02291	13.39	13.36	0.03	0.19
60.94	45.976	0.02290	13.45	13.39	0.06	0.44
68.42	48.043	0.02290	13.49	13.49	0.	0.
75.80	50.086	0.02290	13.59	13.59	0.00	0.03
111.49	60.017	0.02288	14.15	14.16	-0.01	-0.09
146.34	69.823	0.02287	15.10	15.07	0.04	0.25
181.52	79.870	0.02285	16.55	16.43	0.13	0.76
217.64	90.319	0.02284	18.25	18.18	0.08	0.41
19.05	33.107	0.02546	13.19	13.22	-0.03	-0.22
23.97	34.245	0.02546	13.18	13.21	-0.03	-0.22
25.62	34.622	0.02546	13.20	13.21	-0.02	-0.13
29.13	35.434	0.02545	13.19	13.22	-0.03	-0.19
35.65	36.926	0.02545	13.21	13.24	-0.03	-0.19
37.52	37.354	0.02545	13.23	13.24	-0.02	-0.13
46.04	39.301	0.02545	13.28	13.26	0.03	0.19
53.96	41.109	0.02545	13.33	13.28	0.05	0.35
74.75	45.860	0.02544	13.45	13.41	0.04	0.31
83.87	47.949	0.02543	13.55	13.53	0.03	0.19
93.05	50.060	0.02543	13.63	13.65	-0.02	-0.12
135.28	59.845	0.02541	14.25	14.28	-0.03	-0.23
179.76	70.316	0.02539	15.34	15.28	0.05	0.35
217.94	79.472	0.02538	16.65	16.54	0.11	0.65
259.84	89.674	0.02536	18.30	18.25	0.05	0.30

TABLE XII. EXPERIMENTAL VS. CALCULATED C_V - CONTINUED

EXPERIMENTAL VALUES, FROM REFERENCE 7				CALCULATED VALUES, THIS PAPER		
PRESSURE ATM	TEMPERATURE DEG. K	DENSITY GMOLE/CM^3	C_V J/GMOLE-K	C_V J/GMOLE-K	DIFFERENCE J/GMOLE-K	PERCENT DEVIATION
11.03	27.532	0.03073	12.55	12.62	-0.07	-0.53
24.44	29.628	0.03072	12.70	12.77	-0.06	-0.49
40.98	32.215	0.03071	12.95	12.95	0.	0.
54.04	34.262	0.03071	13.12	13.08	0.03	0.26
67.30	36.344	0.03070	13.25	13.21	0.04	0.32
80.58	38.439	0.03070	13.37	13.32	0.05	0.34
93.61	40.505	0.03069	13.47	13.41	0.07	0.50
106.09	42.494	0.03069	13.54	13.49	0.04	0.31
114.76	43.881	0.03068	13.64	13.56	0.08	0.58
127.31	45.898	0.03068	13.74	13.66	0.09	0.64
139.58	47.880	0.03067	13.86	13.80	0.05	0.39
151.89	49.879	0.03067	13.97	13.94	0.03	0.21
213.72	60.070	0.03064	14.69	14.67	0.02	0.11
268.77	69.365	0.03061	15.63	15.59	0.04	0.27
327.68	79.554	0.03059	17.04	17.00	0.03	0.20
27.62	20.140	0.03677	11.34	11.41	-0.08	-0.66
45.92	22.205	0.03676	11.80	11.82	-0.02	-0.18
62.16	24.028	0.03675	12.11	12.12	-0.01	-0.07
63.54	24.182	0.03675	12.13	12.14	-0.01	-0.10
80.54	26.087	0.03674	12.41	12.41	-0.00	-0.03
98.79	28.132	0.03673	12.67	12.69	-0.02	-0.13
116.75	30.145	0.03672	12.90	12.92	-0.02	-0.13
134.52	32.142	0.03671	13.11	13.13	-0.02	-0.16
152.14	34.124	0.03671	13.30	13.32	-0.03	-0.19
169.18	36.050	0.03670	13.48	13.49	-0.01	-0.06
186.11	37.971	0.03669	13.63	13.64	-0.01	-0.09
203.41	39.944	0.03668	13.76	13.76	0.	0.
220.59	41.916	0.03667	13.87	13.87	-0.00	-0.03
237.85	43.909	0.03667	14.00	13.99	0.00	0.03
255.18	45.923	0.03666	14.12	14.12	0.00	0.03
272.74	47.978	0.03665	14.26	14.29	-0.03	-0.21
290.16	50.029	0.03664	14.39	14.46	-0.07	-0.47
306.98	52.051	0.03662	14.52	14.62	-0.10	-0.69
324.34	54.085	0.03662	14.67	14.79	-0.13	-0.86
49.77	19.916	0.03789	11.31	11.31	0.	0.
67.82	21.863	0.03788	11.71	11.71	0.	0.
72.61	22.377	0.03787	11.80	11.81	-0.01	-0.07
87.03	23.924	0.03787	12.06	12.07	-0.01	-0.07
105.78	25.930	0.03786	12.39	12.37	0.02	0.14
125.49	28.037	0.03785	12.67	12.67	0.00	0.03
144.41	30.060	0.03784	12.92	12.92	-0.00	-0.03
163.30	32.082	0.03783	13.15	13.15	-0.00	-0.03
181.71	34.056	0.03782	13.35	13.35	0.	0.
197.41	35.742	0.03781	13.51	13.51	0.00	0.03
214.03	37.538	0.03780	13.65	13.66	-0.02	-0.12
272.42	43.923	0.03777	14.08	14.08	0.	0.
15.16	16.139	0.03791	10.32	10.28	0.04	0.36
36.04	18.404	0.03790	10.92	10.94	-0.02	-0.19
55.16	20.481	0.03789	11.46	11.43	0.03	0.26
69.63	22.038	0.03788	11.74	11.74	-0.00	-0.04
88.75	24.088	0.03787	12.09	12.10	-0.00	-0.03
107.91	26.136	0.03786	12.41	12.40	0.01	0.10
126.85	28.160	0.03785	12.68	12.69	-0.00	-0.03
145.89	30.196	0.03785	12.92	12.94	-0.01	-0.10
164.98	32.239	0.03784	13.16	13.17	-0.01	-0.06
183.80	34.255	0.03783	13.37	13.37	0.	0.
199.86	35.982	0.03782	13.52	13.54	-0.01	-0.09
218.09	37.951	0.03781	13.69	13.70	-0.01	-0.09
236.44	39.930	0.03780	13.82	13.83	-0.00	-0.03
254.58	41.911	0.03780	13.95	13.95	0.00	0.03
272.70	43.900	0.03779	14.08	14.08	-0.00	-0.03
290.82	45.902	0.03778	14.22	14.21	0.00	0.03
309.13	47.938	0.03777	14.35	14.40	-0.05	-0.32
327.43	49.992	0.03776	14.49	14.57	-0.08	-0.55
70.88	18.021	0.03937	10.73	10.76	-0.03	-0.27
90.42	20.048	0.03936	11.23	11.25	-0.02	-0.15
109.45	21.999	0.03935	11.66	11.66	-0.00	-0.04
129.00	23.985	0.03934	12.02	12.02	-0.01	-0.07
148.56	25.963	0.03933	12.36	12.34	0.02	0.14
168.06	27.931	0.03932	12.64	12.64	0.00	0.03
187.65	29.909	0.03931	12.90	12.90	0.	0.
207.43	31.907	0.03930	13.14	13.15	-0.02	-0.13
227.23	33.907	0.03929	13.36	13.38	-0.01	-0.09
246.87	35.894	0.03928	13.56	13.58	-0.02	-0.12
267.29	37.971	0.03927	13.74	13.77	-0.03	-0.24
286.47	39.935	0.03926	13.88	13.92	-0.03	-0.24
305.57	41.897	0.03925	14.02	14.05	-0.04	-0.27
324.96	43.899	0.03924	14.16	14.20	-0.04	-0.27
344.49	45.915	0.03923	14.31	14.35	-0.05	-0.32
198.83	21.991	0.04181	11.52	11.49	0.03	0.29
219.32	23.917	0.04180	11.91	11.89	0.02	0.18
241.50	25.987	0.04179	12.29	12.27	0.02	0.17
263.74	28.055	0.04178	12.62	12.61	0.01	0.07
285.31	30.055	0.04177	12.91	12.91	0.	0.
306.78	32.046	0.04176	13.18	13.18	0.	0.
327.75	33.990	0.04175	13.41	13.41	-0.01	-0.06

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